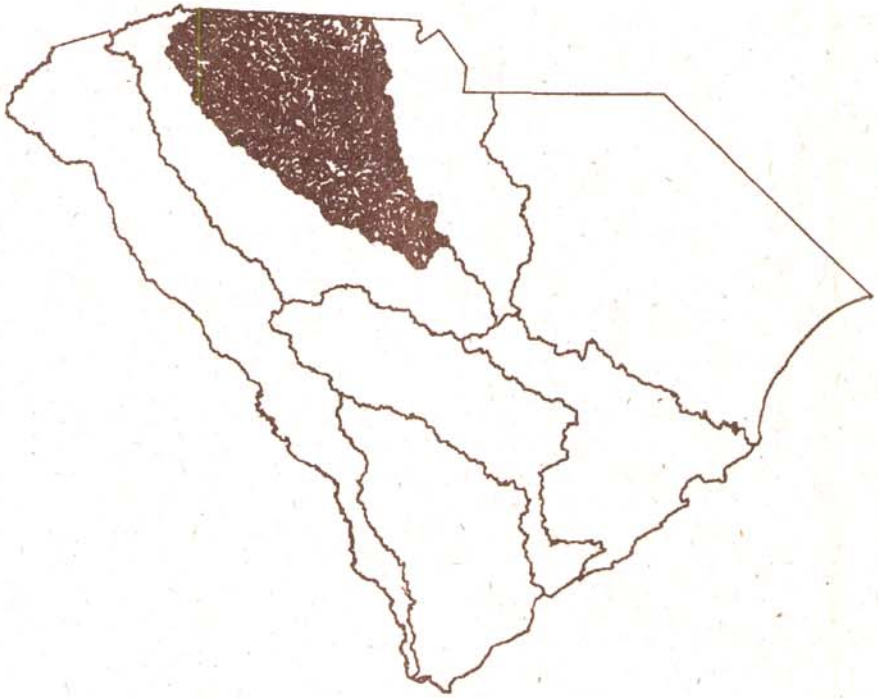
BUREAU OF WATER

South Carolina Department of Health and Environmental Control

Watershed Water Quality Assessment

Broad River Basin



June, 2001

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Watershed Water Quality Assessment

Bróad River Basin

Technical Report No.001-01

November, 2001

Prepared By

South Carolina Department of Health and Environmental Control

Bureau of Water

2600 Bull Street

Columbia, S.C. 29201

(803) 898-4300

PREFACE

In 1993, the South Carolina Department of Health and Environmental Control (SCDHEC) published the first in a series of five watershed management documents. The fifth in that series, Watershed Water Quality Management Strategy: Broad Basin communicated SCDHEC's innovative watershed approach, summarizing water programs and water quality in the basins. The approach continues to evolve and improve.

The watershed documents facilitate broader participation in the water quality management process. Through these publications, SCDHEC shares water quality information with internal and external partners, providing a common foundation for water quality improvement efforts at the local watershed or large-scale, often interstate, river basin level.

Water quality data from the Broad River Basin was collected and assessed at the start of this second five-year watershed management cycle. The assessment incorporates data from many more sites than were included in the first round. This updated atlas provides summary information on a watershed basis, as well as geographical presentations of all permitted watershed activities. A waterbody index and a facility index allow the reader to locate information on specific waters and facilities of interest.

A brief summary of the water quality assessments included in the b ody of this document is provided following the Table of Contents. This summary lists all waters within the Broad River Basin that fully support recreational and aquatic life uses, followed by those waters not supporti ng uses. In addition, the summaries list changes in use support status; those that have improved or degraded over the last five years since the original strategy was written. More comprehensive information can be found in the individual watershed sections. The information provided is accurate to the best of our knowledge at the time of writing and will be updated in five years.

General information on Broad River Basin Watershed Protection and Restoration Strategies can be found under that section on page 23, and more detailed information is located within the individual watershed evaluations.

As SCDHEC continues basinwide and statewide water quality protection and improvement efforts, we are counting on the support and assistance of all stakeholders in the Broad River Basin to participate in bringing about water quality improvements. We look forward to working with you.

If you have questions or comments regarding this document, or if you are seeking further information on the water quality in the Broad River Basin, please contact:

Watershed Strategy Coordinator
SCDHEC Bureau of Water
2600 Bull St.
Columbia, SC 29201
(803) 898-4300
www.scdhec.net/water

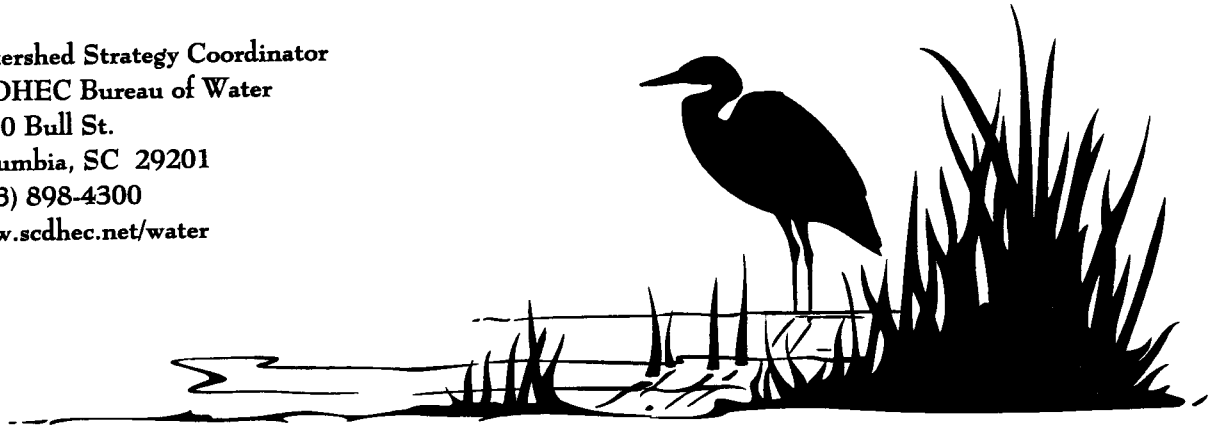

Table of Contents

Water Quality Assessment Summary

Broad River Basin

TERMS USED IN TABLES

AQUATIC LIFE USE SUPPORT (AL) - The degree to which aquatic life is protected is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with standards. Aquatic life use support is based on the percentage of standards excursions at a sampling site.

For **dissolved oxygen** and **pH**:

If the percentage of standard excursions is 10 percent or less, then uses are ***fully supported***.

If the percentage of standard excursions is between 11-25 percent, then uses are ***partially supported***.

If the percentage of standard excursions is greater than 25 percent, uses are ***not supported*** (see p.11 for further information).

For **toxins** (heavy metals, priority pollutants, chlorine, ammonia):

If the acute aquatic life standard for any individual toxicant is not exceeded, uses are ***fully supported***.

If the acute aquatic life standard is exceeded more than once, but is less than or equal to 10 percent of the samples, uses are ***partially supported***.

If the acute aquatic life standard is exceeded in more than 10 percent of the samples, based on at least ten samples, aquatic life uses are ***not supported*** (see p.11 for further information).

RECREATIONAL USE SUPPORT (REC) - The degree to which the swimmable goal of the Clean Water Act is attained (recreational use support) is based on the frequency of fecal coliform bacteria excursions, defined as greater than 400/100 ml for all surface water classes.

If 10 percent or less of the samples are greater than 400/100 ml, then recreational uses are said to be ***fully supported***.

If the percentage of standards excursions is between 11-25%, then recreational uses are said to be ***partially supported***.

If the percentage of standards excursions is greater than 25%, then recreational uses are said to be ***nonsupported*** (see p.12 for further information).

Excursion - The term excursion is used to describe a measurement that does not comply with the appropriate water quality standard.

Table 1. Fully Supported Sites in the Broad River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03050108-010	Durbin Creek	BE-022*		
03050108-020	Cedar Shoals Creek	B-785*		
03050108-030	Warrior Creek	B-742*		
03050108-050	Indian Creek	B-071*		
	Kings Creek	B-799*		
03050107-010	Lake Cunningham	B-341		
	Maple Creek	B-625*		
	Bens Creek	B-782*		
	Ferguson Creek	B-787*		
	South Tyger River	B-741*		
		B-149	Decreasing BOD_5, Turbidity	Decreasing Dissolved Oxygen, pH
03050107-030	North Tyger River	B-017*		
03050107-040	Middle Tyger River	B-794*		
03050107-050	Jimmies Creek	B-786*		
	Dutchman Creek	B-733*		
	Cane Creek	B-777*		
03050107-060	Mitchell Creek	B-781*		
	Sugar Creek	B-779*		
03050105-050	Suck Creek	B-296*		

Table 1. Fully Supported Sites in the Broad River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03050105-090	Ross Creek	B-789*		
	Bowen River	B-788*		
	Lake Cherokee	B-343		
03050105-100	Buffalo Creek	B-740*		
03050105-130	Lake Thicketty	B-342		
03050105-140	Lake York	B-737		
	Long Branch	B-326		Increasing Total Phosphorus
	Clark Fork	B-325		Decreasing pH
		B-157*		
	Bullock Creek	B-739*		
03050105-150	Vaughn Creek	B-099-7*		
	Lake Lanier	B-099B	Decreasing BOD_5	Decreasing pH
	North Pacolet River	B-719*		
	Obed Creek	B-791*		
03050105-160	Spivey Creek	B-104*		
	South Pacolet River	B-720*		
	Lake Bowen	B-340		
		B-339		
	Spartanburg Reservoir #1	B-113	Decreasing BOD_5	Increasing Fecal Coliform

Table 1. Fully Supported Sites in the Broad River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03050105-170	Buck Creek	B-783*		
	Lake Blalock	B-347		
	Pacolet River	B-163A	Decreasing BOD_5	Increasing Total Phosphorus; Decreasing pH
03050105-180	Meadow Creek	B-531*		
03050106-010	Neal Creek	B-778*		
03050106-040	Chester State Park Lake	CL-023		
03050106-050	Cannons Creek	B-751*		
	Lake Monticello	B-328	Decreasing BOD_5, Total Nitrogen, Turbidity	Decreasing Dissolved Oxygen, pH
		B-327	Decreasing Total Nitrogen	
	Cannons Creek	B-346		
		B-345		
03050106-060	Broad River	B-236	Decreasing Total Nitrogen	Increasing Turbidity

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050108-010	Beaverdam Creek	BE-039	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH
		B-796*	AL	PS	Macroinvertebrates		
	Buckhorn Creek	B-795*	AL	PS	Macroinvertebrates		
	Mountain Creek	B-186	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		BE-008*	AL	PS	Macroinvertebrates		
	Princess Creek	B-192	AL	NS	Zinc		Increasing pH
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	
	Brushy Creek	BE-035	AL	PS	Macroinvertebrates		
			REC	NS[T]	Fecal Coliform		
		BE-009	AL	PS	Macroinvertebrates		
			REC	NS[T]	Fecal Coliform	Increasing Fecal Coliform	
	Rocky Creek	BE-007	AL	PS	Macroinvertebrates		
			REC	NS	Fecal Coliform		
	Abner Creek	B-792*	AL	PS	Macroinvertebrates		
	Horsepen Creek	B-793*	AL	PS	Macroinvertebrates		
	Gilder Creek	BE-040	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		B-241	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Increasing pH
		BE-020	AL	PS	Macroinvertebrates		Increasing pH
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050108-010	Lick Creek	B-038	REC	NS	Fecal Coliform		
	Durbin Creek	B-035	REC	NS	Fecal Coliform		
		B-097	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH
	Enoree River	BE-001	AL	NS	Zinc		Decreasing pH
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		B-797*	AL	PS	Macroinvertebrates		
		BE-015	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Increasing pH
		BE-017	AL	NS	Copper		Increasing pH
			REC	NS	Fecal Coliform		
		BE-018	AL	PS	Macroinvertebrates		
			REC	NS	Fecal Coliform		
		BE-019*	AL	PS	Macroinvertebrates		
		BE-037	REC	NS	Fecal Coliform		Decreasing pH
		BE-040	REC	PS	Fecal Coliform		
03050108-020	Enoree River	BE-041	AL	NS	Zinc		Decreasing pH
			REC	PS	Fecal Coliform		
		B-053	REC	NS	Fecal Coliform		
03050108-030	Beaverdam Creek	B-053	REC	NS	Fecal Coliform		
	Warrior Creek	B-150	REC	NS	Fecal Coliform		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050108-040	Beards Fork Creek	B-231	AL	NS	Dissolved Oxygen		Decreasing pH
	Duncan Creek Reservoir	B-735	AL	PS	pH		
	Duncan Creek	B-072	REC	NS	Fecal Coliform		
03050108-050	Enoree River	B-054	AL	NS	Chromium		Decreasing Dissolved Oxygen; Increasing BOD_5, Turbidity
			REC	NS	Fecal Coliform		
03050107-010	Mush Creek	B-317	REC	NS	Fecal Coliform		
	Lake Robinson	CL-100	AL	PS	pH		
	South Tyger River	B-263	REC	PS	Fecal Coliform		Decreasing pH; Increasing Total Phosphorus, Turbidity
		B-005A*	AL	PS	Macroinvertebrates		
		B-005	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH; Increasing Total Phosphorus, Turbidity
		B-332	REC	PS	Fecal Coliform		
03050107-020	Lake Cooley	B-348	AL	PS	pH		
	North Tyger River Tributary	B-315	REC	NS	Fecal Coliform		Decreasing pH
	North Tyger River	B-219	AL	NS	Zinc		Decreasing Dissolved Oxygen pH; Increasing Turbidity
			REC	NS	Fecal Coliform		
03050107-030	North Tyger River	B-018A	REC	NS	Fecal Coliform		Decreasing Dissolved Oxygen; Increasing Total Phosphorus
03050107-040	Beaverdam Creek	B-784*	AL	PS	Macroinvertebrates		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050107-040	Middle Tyger River	B-148	REC	NS[T]	Fecal Coliform	Increasing Fecal Coliform	Increasing Turbidity
		B-012	REC	NS	Fecal Coliform		Decreasing pH
		B-014	REC	NS	Fecal Coliform		
03050107-050	Tyger River	B-008	REC	NS	Fecal Coliform		Decreasing Dissolved Oxygen, pH; Increasing Turbidity
		B-051	REC	NS	Fecal Coliform		Decreasing pH; Increasing Total Phosphorus
	Jimmies Creek	B-072	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH; Increasing Total Phosphorus
03050107-060	Fairforest Creek	B-020	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		B-164	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Increasing Total Phosphorus
		B-021	AL	NS	Macroinvertebrates, Chromium, Zinc Copper		B-219
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		BF-007	REC	NS	Fecal Coliform		
		BF-008	REC	NS	Fecal Coliform		Decreasing pH; Increasing Total Phosphorus
	Fairforest Creek Tributary	B-321	AL	NS	Chromium, Copper, Zinc		Decreasing pH
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	
	Kelsey Creek	B-235	REC	NS	Fecal Coliform		Decreasing Dissolved Oxygen; pH
	Lake Johnson	CL-035	AL	NS	pH		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050107-060	Lake Craig	CL-033	AL	PS	pH		
	Mitchell Creek	B-199	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
	Toschs Creek	B-067A	REC	NS	Fecal Coliform		Decreasing pH
		B-067B	REC	NS	Fecal Coliform		Decreasing pH
	Tinkers Creek	B-286	REC	NS	Fecal Coliform		Decreasing pH; Increasing Total Phosphorus
		B-287	REC	NS	Fecal Coliform		
		B-336	REC	NS	Fecal Coliform		
03050105-090	Canoe Creek	B-088	AL	PS	Dissolved Oxygen		Decreasing pH
			REC	NS	Fecal Coliform		
	Peoples Creek	B-211	REC	NS	Fecal Coliform		Decreasing pH
	Furnace Creek	B-100	REC	NS	Fecal Coliform		
	Doolittle Creek	B-323	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH, Dissolved Oxygen
	Guyonmoore Creek	B-330	REC	PS	Fecal Coliform		
	Broad River	B-042	REC	PS	Fecal Coliform		Increasing Turbidity
	Broad River	B-044	REC	PS	Fecal Coliform		Increasing Turbidity
03050105-100	Buffalo Creek	B-119	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		B-057	AL	PS	Copper	Increasing Fecal Coliform	
			REC	NS	Fecal Coliform		
03050105-110	Cherokee Creek	B-056	REC	NS	Fecal Coliform		Decreasing pH

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050105-110	Cherokee Creek	B-679*	AL	PS	Macroinvertebrates		
03050105-120	Kings Creek	B-333	REC	PS	Fecal Coliform		
03050105-130	Irene Creek	B-059	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH
	Limestone Creek	B-128	REC	NS	Fecal Coliform		Decreasing pH
	Gilkey Creek	B-334	REC	NS	Fecal Coliform		
	Thicketty Creek	B-095	REC	NS	Fecal Coliform		Decreasing pH
		B-133	REC	NS	Fecal Coliform		Decreasing pH
		B-062	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
03050105-140	Bullock Creek	B-159	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
03050105-150	Lake Lanier	B-099A	REC	PS	Fecal Coliform		Decreasing Dissolved Oxygen; Increasing Turbidity
	Page Creek	B-301	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH
	North Pacolet River	B-026	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing Dissolved Oxygen, pH
		B-126	REC	NS	Fecal Coliform		
03050105-160	Spivey Creek	B-103	REC	PS	Fecal Coliform		Decreasing pH
	Motlow Creek	B-790*	AL	PS	Macroinvertebrates		
	South Pacolet River	B-302	REC	NS	Fecal Coliform		Decreasing pH
03050105-170	Little Buck Creek	B-259	REC	NS	Fecal Coliform		
	Potter Branch	B-191	REC	NS	Fecal Coliform		Decreasing pH
	Pacolet River	B-028	REC	NS	Fecal Coliform		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050105-170	Pacolet River	B-331	REC	PS	Fecal Coliform		
03050105-180	Lawsons Fork Creek	B-221	AL	PS	Macroinvertebrates	Increasing Fecal Coliform	Increasing Total Phosphorus; Decreasing pH
			REC	NS	Fecal Coliform		
		B-277	REC	NS	Fecal Coliform		Increasing Total Phosphorus; Decreasing pH
		B-278	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Increasing Total Phosphorus; Decreasing pH
		BL-005	REC	NS	Fecal Coliform		Increasing Total Phosphorus; Decreasing pH
		BL-001	AL	PS	Macroinvertebrates	Increasing Fecal Coliform	Increasing Total Nitrogen; Decreasing pH
			REC	NS	Fecal Coliform		
03050105-190	Mill Creek	B-780*	AL	PS	Macroinvertebrates		
	Pacolet River	BP-001	REC	NS	Fecal Coliform		Decreasing pH
		B-048	REC	NS	Fecal Coliform		
03050106-010	John D. Long Lake	B-344	AL	NS	pH		
	Broad River	B-331	REC	PS	Fecal Coliform		Decreasing pH
03050106-020	Ross Branch	B-086	REC	NS	Fecal Coliform		
	Turkey Creek	B-136	REC	PS	Fecal Coliform		
03050106-030	Meng Creek Tributary	B-243	REC	NS	Fecal Coliform		
	Meng Creek	B-064	REC	NS	Fecal Coliform		Decreasing pH
	Browns Creek	B-155	REC	PS	Fecal Coliform		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050106-030	Gregorys Creek	B-335	REC	NS	Fecal Coliform		
03050106-040	Dry Fork	B-074	REC	NS	Fecal Coliform		Decreasing pH
	Sandy River	B-075	REC	NS	Fecal Coliform		Decreasing pH
03050106-050	Gregorys Creek	B-074	REC	PS	Fecal Coliform		Increasing Turbidity
	Heller Creek	B-151*	AL	PS	Macroinvertebrates		
03050106-060	Crims Creek	B-800*	AL	PS	Macroinvertebrates		
	Wateree Creek	B-801*	AL	PS	Macroinvertebrates		
	Elizabeth Lake	B-110*	REC	PS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH
	Cranes Creek	B-081*	AL	PS	Macroinvertebrates		
		B-316	AL	NS	Zinc		
			REC	PS	Fecal Coliform		
	Smith Branch	B-280	AL	NS	Macroinvertebrates, Zinc		Increasing Total Phosphorus
			REC	NS	Fecal Coliform		
	Broad River	B-337	REC	PS	Fecal Coliform		
		B-080	AL	NS	Copper		
			REC	PS	Fecal Coliform		
03050106-070	Little River	B-145	REC	NS	Fecal Coliform		
03050106-080	Winnsboro Branch	B-123	REC	NS	Fecal Coliform		

Table 2. Impaired Sites in the Broad River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03050106-080	Winnsboro Branch	B-077	AL	NS	Copper, Zinc		Increasing Total Phosphorus
			REC	NS	Fecal Coliform		
	Jackson Creek	B-102	AL	PS	Macroinvertebrates		
			REC	PS	Fecal Coliform		
	Mill Creek	B-338	REC	NS	Fecal Coliform		
03050106-090	Big Cedar Creek	B-320	REC	PS[T]	Fecal Coliform		"

Table 3. Changes in Use Support Status

Broad River Basin Sites that Improved from 1995 to 1999

REC= Recreational; AL=Aquatic Life; FS=Fully Supported Standards; PS=Partially Supported Standards; NS=Nonsupported Standards

Watershed	Waterbody Name	Station #	Use	Status		Water Quality Indicator	
				1995	1999	1995	1999
03050108-020	Enoree River	B-041	REC	NS	PS	Fecal Coliform	Fecal Coliform
03050108-040	Beards Fork Creek	B-231	REC	PS	FS	Fecal Coliform	
03050107-010	South Tyger River	B-263	REC	NS	PS	Fecal Coliform	Fecal Coliform
03050107-050	Tyger River	B-051	AL	NS	FS	Zinc	
03050107-060	Fairforest Creek	BF-007	AL	PS	FS	Dissolved Oxygen	
03050105-090	Broad River	B-044	AL	NS	FS	Cadmium, Lead, Chromium, Zinc, Copper	
03050105-140	Long Branch	B-326	REC	PS	FS	Fecal Coliform	
	Clark Fork	B-325	REC	PS	FS	Fecal Coliform	
03050105-170	Pacolet River	B-163A	REC	PS	FS	Fecal Coliform	
		B-331	REC	NS	PS	Fecal Coliform	Fecal Coliform
03050106-060	Crane Creek	B-316	REC	NS	PS	Fecal Coliform	Fecal Coliform
	Broad River	B-236	REC	PS	FS	Fecal Coliform	
03050106-080	Jackson Creek	B-102	REC	NS	PS	Fecal Coliform	Fecal Coliform

Table 4. Changes in Use Support Status

Broad River Basin Sites that Degraded from 1995 to 1999

REC= Recreational; AL=Aquatic Life; FS=Fully Supported Standards; PS=Partially Supported Standards; NS=Nonsupported Standards

Watershed	Waterbody Name	Station #	Use	Status		Water Quality Indicator	
				1995	1999	1995	1999
03050108-010	Princess Creek	B-192	REC	PS	NS	Fecal Coliform	Fecal Coliform
	Brushy Creek	BE-009	AL	FS	PS		Macroinvertebrates
	Rocky Creek	BE-007	AL	FS	PS		Macroinvertebrates
	Gilder Creek	BE-020	AL	FS	PS		Macroinvertebrates
	Enoree River	BE-001	REC	PS	NS	Fecal Coliform	Fecal Coliform
		BE-017	AL	PS	NS	Copper	Copper
		B-037	REC	PS	NS	Fecal Coliform	Fecal Coliform
03050108-020	Enoree River	B-041	AL	FS	NS		Zinc
03050108-040	Beards Fork Creek	B-231	AL	PS	NS	Dissolved Oxygen	Dissolved Oxygen
	Duncan Creek Reservoir 6B	B-735	AL	FS	PS		pH
03050108-050	Enoree River	B-054	AL	FS	NS		Chromium
03050107-010	Mush Creek	B-317	REC	PS	NS	Fecal Coliform	Fecal Coliform
	South Tyger River	B-005	REC	PS	NS	Fecal Coliform	Fecal Coliform
		B-332	REC	FS	PS		Fecal Coliform
03050107-020	Lake Cooley	B-348	AL	FS	PS		pH
	North Tyger River	B-219	AL	PS	NS	Zinc	Zinc
03050107-060	Lake Johnson	CL-035	AL	FS	NS		pH
	Lake Craig	CL-033	AL	FS	NS		pH
	Fairforest Creek	BF-007	REC	PS	NS	Fecal Coliform	Fecal Coliform
		BF-008	REC	PS	NS	Fecal Coliform	Fecal Coliform
03050105-090	Broad River	B-044	REC	PS	NS	Fecal Coliform	Fecal Coliform
03050106-010	Lake John D. Long	B-344	AL	FS	NS		pH
03050106-020	Turkey Creek	B-136	REC	FS	PS		Fecal Coliform
03050106-030	Gregorys Creek	B-335	REC	FS	PS		Fecal Coliform
03050106-060	Elizabeth Lake	B-110	AL	FS	PS		pH
	Broad River	B-337	REC	FS	PS		Fecal Coliform
03050106-080	Winnsboro Branch	B-077	AL	FS	NS		Copper, Zinc

Introduction

The South Carolina Department of Health and Environmental Control (SCDHEC or the Department) initiated its first watershed planning activities as a result of a U.S. Environmental Protection Agency (USEPA) grant in June of 1972. These activities were soon extended by requirements for a Continuing Planning Process under §303(e), "Federal Water Pollution Control Act Amendments of 1972", U.S. Public Law 92-500. In 1975, the SCDHEC published basin-planning reports for the four major basins in South Carolina. Watershed assessments are updated every five years for all river basins in the state. A related planning activity resulted from §208 of the Federal Water Pollution Control Act, which required states to prepare planning documents on an areawide basis. Areawide plans were completed in the late 1970's for the five designated areas of the State and for the nondesignated remainder of the State. To date, these plans or their updated versions have served as information sources and guides for water quality management. The Continuing Planning Process, watershed assessments, and 208 plans are elements of South Carolina's overall water quality management plan.

The Bureau of Water emphasizes watershed planning to better coordinate river basin planning and water quality management. Watershed-based management allows the Department to address Congressional and Legislative mandates in a coordinated manner and to better utilize current resources. The watershed approach also improves communication between the Department, the regulated community, and the public on existing and future water quality issues.

Purpose of the Watershed Water Quality Assessment

A watershed is a geographic area into which the surrounding waters, sediments, and dissolved materials drain, and whose boundaries extend along surrounding topographic ridges. Watershed-based water quality management recognizes the interdependence of water quality related activities associated with a drainage basin including: monitoring, problem identification and prioritization, water quality modeling, planning, permitting, and other activities. The Bureau of Water's Watershed Water Quality Management Program integrates these activities by watershed, resulting in watershed management plans that appropriately focus water quality protection efforts. While an important aspect of the program is water quality problem identification and solution, the emphasis is on problem prevention.

The Department has divided the State into five regions (areas consisting of one or more river basins), along hydrologic lines, which contain approximately the same number of NPDES permitted dischargers. A Watershed Water Quality Assessment (WWQA) will be created for each river basin within the five regions and will be updated on a five-year rotational basis. This will allow for effective allocation and coordination of water quality activities and efficient use of available resources. The Broad River Basin is subdivided into 32 watersheds or hydrologic units within the State of South Carolina. Within the Department's Broad Basin are the Enoree River Basin, the Tyger River Basin, and the Broad River Basin. The hydrologic units used are the USDA Natural Resource Conservation Service 11-digit codes for South Carolina. All water quality related evaluations will be made at the watershed level. The stream names used are derived from USGS topographic maps. USEPA Reach data (RF3) were used for the digital hydrography and stream length estimates. Based on the blue line streams of the USGS topo maps, it is

likely that portions of the stream network in terms of perennial, intermittent, and ephemeral streams are not represented.

The watershed-based assessments fulfill a number of USEPA reporting requirements including various activities under §303(d), §305(b), §314, and §319 of the Clean Water Act (CWA). Section 303(d) requires a listing of waters located within a watershed that do not meet applicable water quality standards. Section 305(b) requires that the State biennially submit a report that includes a water quality description and analysis of all navigable waters to estimate environmental impacts. Section 314 requires that the State submit a biennial report that identifies, classifies, describes, and assesses the status and trends in water quality of publicly owned lakes. The watershed plan is also a logical evaluation, prioritization, and implementation tool for nonpoint source (§319) requirements. Nonpoint source best management practices (BMPs) can be selected by identifying water quality impairments and necessary controls, while considering all the activities occurring in the drainage basin.

The assessment also allows for more efficient issuance of National Pollutant Discharge Elimination System (NPDES) and State wastewater discharge permits. Proposed permit issuances within a watershed may be consolidated and presented to the public in groups, rather than one at a time, allowing the Department to realize a resource savings, and the public to realize an information advantage.

The Watershed Water Quality Assessment (WWQA) is a geographically-based document that describes, at the watershed level, all water quality related activities that may potentially have a negative impact on water quality. The Watershed Implementation Staff investigates the impaired streams mentioned in the WWQA to determine, where possible, the source of the impairment and recommends solutions to correct the problems. As part of this effort, the watershed staff is forging partnerships with various federal and state agencies, local governments, and community groups. In particular, the Department's Watershed Program and the Natural Resource Conservation Service (NRCS) district offices are working together to address some of the nonpoint source (NPS) concerns in the basin. By combining NRCS's local knowledge of land use and the Department's knowledge of water quality, we are able to build upon NRCS's close relationships with landowners and determine where NPS projects are needed. These projects may include educational campaigns or special water quality studies.

Factors Assessed in Watershed Evaluations

Water Quality

The Water Program comprises activities within SCDHEC's Bureau of Water and Bureau of Environmental Services. The Program's objectives are to ensure that the water in South Carolina is safe for drinking and recreation, and that it is suitable to support and maintain aquatic flora and fauna. Functions include planning, permitting, compliance assurance, enforcement, and monitoring. This section provides an overview of water quality evaluation and protection activities.

Monitoring

In an effort to evaluate the State's water quality, the Department operates and collects data from a permanent statewide network of primary and secondary ambient monitoring stations and flexible, rotating watershed monitoring stations. The ambient monitoring network is directed toward determining long-term water quality trends, assessing attainment of water quality standards, identifying locations in need of additional attention, and providing background data for planning and evaluating stream classifications and standards.

Ambient monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining State and Federal water quality standards and criteria in the receiving streams in accordance with the goals of the Clean Water Act. These standards and criteria define the instream chemical concentrations that provide for protection and reproduction of aquatic flora and fauna, help determine support of the classified uses of each waterbody, and serve as instream limits for the regulation of wastewater discharges or other activities. In addition, these data are used in the preparation of the biennial §305(b) report to Congress, which summarizes the State's water quality with respect to attainment of classified uses by comparing the ambient monitoring network data to the State Water Quality Standards.

SCDHEC's ambient water quality monitoring network comprises four station types: primary (P), secondary (S), watershed (W), and biological (BIO) stations. These station types are listed in the site descriptions preceding the water quality information in each watershed and in the Appendices under Ambient Water Quality Monitoring Site Descriptions. Not all parameters are collected at every site. Primary stations are sampled on a monthly basis year round, and are located in high water-use areas or upstream of high water-use areas. The static primary station network is operated statewide, and receives the most extensive parameter coverage, thus making it best suited for detecting long-term trends.

Secondary stations are sampled monthly from May through October, a period critical to aquatic life, and is characterized by higher water temperatures and lower flows. Secondary stations are located in areas where specific monitoring is warranted due to point source discharges, or in areas with a history of water quality problems. Secondary station parameter coverage is less extensive and more flexible than primary or watershed station coverages. The number and locations of secondary stations have greater annual variability than do those in the primary station network, and during a basin's target year may have parameter coverage and sampling frequency duplicating that of primary or watershed stations.

Watershed stations are sampled on a monthly basis, year round, during a basin's target year. Additional watershed stations may be sampled monthly from May through October to augment the secondary station network. Watershed stations are located to provide more complete and representative coverage within the larger drainage basin, and to identify additional monitoring needs. Watershed stations have the same parameter coverage as primary stations.

Ambient trend monitoring, utilizing biological stations, is conducted to collect data to indicate general biological conditions of State waters that may be subject to a variety of point and nonpoint source impacts. In 1991, the Department began incorporating ambient macroinvertebrate data into the development of Watershed Water Quality Assessments. Ambient sampling is also used to establish regional reference or "least impacted" sites from which to make comparisons in future monitoring. Additionally, special macroinvertebrate studies, in which stream specific comparisons among stations located upstream and downstream from a known discharge or nonpoint source area, are used to assess impact.

Qualitative sampling of macroinvertebrate communities is the primary bioassessment technique used in ambient trend monitoring. A habitat assessment of general stream habitat availability and a substrate characterization is conducted at each site. Annual ambient monitoring is conducted during low flow "worst case" conditions in July - September. Some coastal plain streams that have no flow conditions in the summer months may be sampled in the winter (January-March). This technique may also be used in special studies for the purpose of determining if, and to what extent, a wastewater discharge or nonpoint source runoff is impacting the receiving stream. A minimum of two sample locations, one upstream and one downstream from a discharge or runoff area, is collected. At least one downstream recovery station is also established when appropriate. Sampling methodology follows procedures described in Standard Operating Procedures, Biological Monitoring. Only sites described as 'BIO' will collect information on the macroinvertebrate communities used in the ambient trend monitoring.

Many pollutants may be components of point source discharges, but may be discharged in a discontinuous manner, or at such low concentrations that water column sampling for them is impractical. Some pollutants are also common in nonpoint source runoff, reaching waterways only after a heavy rainfall; therefore, in these situations, the best media for the detection of these chemicals are sediment and fish tissue where they may accumulate over time. Their impact may also affect the macroinvertebrate community.

Aquatic sediments represent a historical record of chronic conditions existing in the water column. Pollutants bind to particulate organic matter in the water column and settle to the bottom where they become part of the sediment "record". Accumulated sediments not only reflect the impact of point source discharges, but also incorporate nonpoint source pollution washed into the stream during rain events. As a result, contaminant concentrations originating from irregular and highly variable sources are recorded in the sediment. The sediment concentrations at a particular location do not vary as rapidly with time as do the water column concentrations. Thus, the sediment record may be read at a later time, unrelated to the actual release time. Lakes act as settling basins for materials entering the lake system directly from a discharge or indirectly from the land surface washed into streams. Therefore, it is not unusual for lake

sediment concentrations to be higher than sediment concentrations found in streams. This is especially true for chromium, copper, and zinc.

The ambient monitoring program has the capability of sampling a wide range of media and analyzing them for the presence or effects of contaminants. Ambient monitoring data from 25 primary (P) stations, 73 secondary (S) stations, 34 watershed (W) stations, and 68 biological (BIO) stations were reviewed for the Broad River Basin.

Classified Waters, Standards, and Natural Conditions

The waters of the State have been classified in regulation based on the desired uses of each waterbody. State standards for various parameters have been established to protect all uses within each classification. For a more detailed explanation of water classifications and standards, see South Carolina Regulation 61-68. The water-use classifications that apply to this basin are as follows.

Class ORW, or "outstanding resource waters", are freshwaters or saltwaters that constitute an outstanding recreational or ecological resource, or those freshwaters suitable as a source for drinking water supply purposes, with treatment levels specified by the Department.

Class A were freshwaters that were suitable for primary contact recreation. This class was also suitable for uses listed as Class B. As of April 1992, Class A and Class B waters were reclassified as Class FW, which protects for primary contact recreation.

Class B were freshwaters that were suitable for secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters were suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class was also suitable for industrial and agricultural uses. The main difference between the Class A and B freshwater was the fecal coliform standard. Class A waters were not to exceed a geometric mean of 200/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 10% of the total samples during any 30 day period to exceed 400/100ml. Class B waters were not to exceed a geometric mean of 1000/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 20% of the total samples during any 30 day period to exceed 2000/100ml. As of April 1992, Class A and Class B waters were reclassified as Class FW, which protects for primary contact recreation.

Class FW, or "freshwaters", are freshwaters that are suitable for primary and secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters are suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class is also suitable for industrial and agricultural uses.

Site specific numeric standards (*) for surface waters may be established by the Department to replace the numeric standards found in Regulation 61-68 or to add new standards not contained in R.61-68. Establishment of such standards shall be subject to public participation and administrative procedures for adopting regulations. In addition, such site specific numeric standards shall not apply to tributary or downstream waters unless specifically described in the water classification listing in R.61-69.

The standards are used as instream water quality goals to maintain and improve water quality and also serve as the foundation of the Bureau of Water's program. They are used to determine permit limits for treated wastewater dischargers and any other activities that may impact water quality. Using mathematical Wasteload Allocation Models, the impact of a wastewater discharge on a receiving stream is

predicted. For free flowing streams, 7Q10 is defined as the critical low flow. For highly regulated streams and tidal streams, other more appropriate critical flows may be determined. These predictions are then used to set limits for different pollutants on the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The NPDES permit limits are set so that, as long as a permittee (wastewater discharger) meets the established permit limits, the discharge should not cause a standards violation in the receiving stream. All discharges to the waters of the State are required to have an NPDES permit and must abide by those limits, under penalty of law.

Classifications are based on desired uses, not on natural or existing water quality, and are a legal means to obtain the necessary treatment of discharged wastewater to protect designated uses. Actual water quality may not have a bearing on a waterbody's classification. A waterbody may be reclassified if desired or existing public uses justify the reclassification and the water quality necessary to protect these uses is attainable. A classification change is an amendment to a State regulation and requires public participation, SCDHEC Board approval, and General Assembly approval.

Natural conditions may prevent a waterbody from meeting the water quality goals as set forth in the standards. The fact that a waterbody does not meet the specified numeric standards for a particular classification does not mean the waterbody is polluted or of poor quality. Certain types of waterbodies (ie. swamps, lakes, tidal creeks) may naturally have water quality lower than the numeric standards. A waterbody can have water quality conditions below standards due to natural causes and still meet its use classification. A site specific numeric standard may be established by the Department after being subjected to public participation and administrative procedures for adopting regulations. Site specific numeric standards apply only to the stream segment described in the water classification listing, not to tributaries or downstream unspecified waters.

Lake Trophic Status

Trophic status is a characterization of a lake's biological productivity based on the availability of plant nutrients, especially phosphorus. Commonly accepted systems for describing trophic status recognize a range of conditions, with "oligotrophic" indicating the least biologically productive lakes and "eutrophic" indicating significantly higher levels of productivity. A lake's trophic condition may shift over time. The trophic condition of South Carolina lakes is monitored through SCDHEC's network of routine sampling stations and through periodic sampling of additional lakes. All lakes of at least 40 acres in area that offer public access are monitored.

Most commonly, large external inputs of nutrients from point and/or nonpoint sources lead to advanced eutrophication. Advanced eutrophication is indicated by excessive algal growth, rapid sedimentation, and seasonal or daily dissolved oxygen deficiencies. Advanced eutrophication can cause undesirable shifts in the composition of aquatic life, or even fish kills. Restoring a lake to a more desirable trophic condition requires reductions in nutrient inputs, usually phosphorus.

Water Quality Indicators

Water quality data are used to describe the condition of a waterbody, to help understand why that condition exists, and to provide some clues as to how it may be improved. Water quality indicators

include physical, chemical, and biological measurements. Copies of the Standard Operating Procedures used for these measurements are available from the Department's Bureau of Water and the Bureau of Environmental Services. The current State of S.C. Monitoring Strategy is available on our website at www.scdhec.net/eqc/admin/html/eqcpubs.html#wqreports and describes what parameters are sampled, where they are sampled, and how frequently.

MACROINVERTEBRATE COMMUNITY

Macroinvertebrates are aquatic insects and other aquatic invertebrates associated with the substrates of waterbodies (including, but not limited to, streams, rivers, tidal creeks, and estuaries). Macroinvertebrates can be useful indicators of water quality because these communities respond to integrated stresses over time that reflect fluctuating environmental conditions. Community responses to various pollutants (e.g. organic, toxic, and sediment) may be assessed through interpretation of diversity, known organism tolerances, and in some cases, relative abundances and feeding types.

FISH TISSUE

Many pollutants occur in such low concentrations in the water column that they are usually below analytical detection limits. Over time many of these chemicals may accumulate in fish tissue to levels that are easily measured. By analyzing fish tissue it is possible to see what pollutants may be present in waterbodies at very low levels. This information can also be used to determine if consumption of the fish poses any undue human health concerns and to calculate consumption rates that are safe.

DISSOLVED OXYGEN

Oxygen is essential for the survival and propagation of aquatic organisms. If the amount of oxygen dissolved in water falls below the minimum requirements for survival, aquatic organisms or their eggs and larvae may die. A severe example is a fish kill. Dissolved oxygen (DO) varies greatly due to natural phenomena, resulting in daily and seasonal cycles. Different forms of pollution also can cause declines in DO.

Changes in DO levels can result from temperature changes or the activity of plants and other organisms present in a waterbody. The natural diurnal (daily) cycle of DO concentration is well documented. Dissolved oxygen concentrations are generally lowest in the morning, climbing throughout the day due to photosynthesis and peaking near dusk, then steadily declining during the hours of darkness.

There is also a seasonal DO cycle in which concentrations are greater in the colder, winter months and lower in the warmer, summer months. Streamflow (in freshwater) is generally lower during the summer and fall, and greatly affects flushing, reaeration, and the extent of saltwater intrusion, all of which affect dissolved oxygen values.

BIOCHEMICAL OXYGEN DEMAND

Five-day biochemical oxygen demand (BOD_5) is a measure of the amount of dissolved oxygen consumed by the decomposition of carbonaceous and nitrogenous matter in water over a five-day period. The BOD_5 test indicates the amount of biologically oxidizable carbon and nitrogen that is present in

wastewater or in natural water. Matter containing carbon or nitrogen uses dissolved oxygen from the water as it decomposes, which can result in a dissolved oxygen decline. The quantity of BOD_5 discharged by point sources is limited through the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The discharge of BOD_5 from a point source is restricted by the permits so as to maintain the applicable dissolved oxygen standard.

pH

pH is a measure of the hydrogen ion concentration of water, and is used to indicate degree of acidity. The pH scale ranges from 0 to 14 standard units (SU). A pH of 7 is considered neutral, with values less than 7 being acidic, and values greater than 7 being basic.

Low pH values are found in natural waters rich in dissolved organic matter, especially in Coastal Plain swamps and black water rivers. The tannic acid released from the decomposition of vegetation causes the tea coloration of the water and low pH.

High pH values in lakes during warmer months are associated with high phytoplankton (algae) densities. The relationship between phytoplankton and daily pH cycles is well established. Photosynthesis by phytoplankton consumes carbon dioxide during the day, which results in a rise in pH. In the dark, phytoplankton respiration releases carbon dioxide. In productive lakes, carbon dioxide decreases to very low levels, causing the pH to rise to 9-10 SU. Continuous flushing in streams prevents the development of significant phytoplankton populations and the resultant chemical changes in water quality.

Fecal Coliform Bacteria

Coliform bacteria are present in the digestive tract and feces of all warm-blooded animals, including humans, poultry, livestock, and wild animal species. Fecal coliform bacteria are themselves generally not harmful, but their presence indicates that surface waters may contain pathogenic microbes. Diseases that can be transmitted to humans through water contaminated by improperly treated human or animal waste are the primary concern. At present, it is difficult to distinguish between waters contaminated by animal waste and those contaminated by human waste.

Public health studies have established correlations between fecal coliform numbers in recreational and drinking waters and the risk of adverse health effects. Based on these relationships, the USEPA and SCDHEC have developed enforceable standards for surface waters to protect against adverse health effects from various recreational or drinking water uses. Proper waste disposal or sewage treatment prior to discharge to surface waters minimizes this type of pollution.

Nutrients

Oxygen demanding materials and plant nutrients are common substances discharged to the environment by man's activities, through wastewater facilities and by agricultural, residential, and stormwater runoff. The most important plant nutrients, in terms of water quality, are phosphorus and nitrogen. In general, increasing nutrient concentrations are undesirable due to the potential for accelerated growth of aquatic plants, including algae. Nuisance plant growth can create imbalances in the aquatic

community, as well as aesthetic and access issues. High densities of phytoplankton (algae) can cause wide fluctuations in pH and dissolved oxygen.

The forms of nitrogen routinely analyzed at SCDHEC stations are ammonia and ammonium nitrogen (NH_3/NH_4), total Kjeldahl nitrogen (TKN), and nitrite and nitrate nitrogen (NO_2/NO_3). Ammonia and ammonium are readily used by plants. TKN is a measure of organic nitrogen and ammonia in a sample. Nitrate is the product of aerobic transformation of ammonia, and is the most common form used by aquatic plants. Nitrite is usually not present in significant amounts.

Total phosphorus (TP) is commonly measured to determine phosphorus concentrations in surface waters. TP includes all of the various forms of phosphorus (organic, inorganic, dissolved, and particulate) present in a sample.

TURBIDITY

Turbidity is an expression of the scattering and absorption of light through water. The presence of clay, silt, fine organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms increases turbidity. Increasing turbidity can be an indication of increased runoff from land. It is an important consideration for drinking water as finished water has turbidity limits.

TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) are the suspended organic and inorganic particulate matter in water. Although increasing TSS can also be an indication of increased runoff from land, TSS differs from turbidity in that it is a measure of the mass of material in, rather than light transmittance through, a water sample. High TSS can adversely impact fish and fish food populations and damage invertebrate populations. There are no explicit State standards for TSS.

HEAVY METALS

Concentrations of cadmium, chromium, copper, lead, mercury, and nickel in water are routinely measured by the Department to compare to State standards intended to protect aquatic life and human health. These metals occur naturally in the environment, and many are essential trace elements for plants and animals. Human activities, such as land use changes and industrial and agricultural processes have resulted in an increased flux of metals from land to water. Atmospheric inputs are recognized as important sources of metals to aquatic systems. Metals are released to the atmosphere from the burning of fossil fuels (coal, oil, gasoline), wastes (medical, industrial, municipal), and organic materials. The metals are then deposited on land and in waterways from the atmosphere via rainfall and attached to particulates (dry deposition).

Assessment Methodology

The Watershed Water Quality Assessment is a geographically-based document that describes, at the watershed level, water quality as well as conditions and activities related to water quality. Significant revisions to South Carolina's Water Quality Standards were effective on June 22, 2001. USEPA approved these standards for use in implementing the Clean Water Act on November 28, 2001. The data

assessments for this document were based on previous Water Quality Standards. This section provides an explanation of the information assessment methodology used to generate the watershed-level summaries. Water quality data summaries used in this assessment are presented in Appendices A-C.

USE SUPPORT DETERMINATION

At the majority of SCDHEC's surface water monitoring stations, samples for analysis are collected as surface grabs once per month, quarter, or year, depending on the parameter. Grab samples collected at a depth of 0.3 meters are considered surface measurements, and are used to establish representative physical conditions and chemical concentrations in the waterbodies sampled. At most stations sampled by boat, dissolved oxygen and temperature are sampled as a water column profile, with measurements being made at a depth of 0.3 meters below the water surface and at one-meter intervals to the bottom. At stations sampled from bridges, these parameters are measured only at a depth of 0.3 meters. All water and sediment samples are collected and analyzed according to standard procedures. Macroinvertebrate community structure is analyzed routinely at selected stations as a means of detecting adverse biological impacts on the aquatic fauna due to water quality conditions which may not be readily detectable in the water column chemistry.

For the purpose of assessment, only results from surface samples are used in water quality standards comparisons and trend assessments. This information is considered to represent "average" conditions, as opposed to extremes, because of the inability to target individual high or low flow events on a statewide basis. Results from water quality samples can be compared to State standards and USEPA criteria, with some restrictions due to time of collection and sampling frequency. The monthly sampling frequency employed in the ambient monitoring network may be insufficient for strict interpretation of certain standards. The USEPA does not define the sampling method or frequency other than indicating that it should be "representative." A grab sample is considered to be representative for indicating excursions relative to standards: a single grab sample is more representative of a one-hour average than a four-day average, more representative of a one-day average than a one-month average, and so on (see also Screening & Additional Considerations for Water Column Metals below). When the sampling method or frequency does not agree with the intent of the particular standard, conclusions about water quality should be considered as only an indication of conditions.

The time period used to assess standards compliance is the most recent complete five years of data, which for the Broad River Basin is 1995 through 1999.

AQUATIC LIFE USE SUPPORT

One important goal of the Clean Water Act and State standards is to maintain the quality of surface waters in order to provide for the survival and propagation of a balanced indigenous aquatic community of fauna and flora. The degree to which aquatic life is protected (aquatic life use support) is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with standards. Aquatic life use support is based on the percentage of standards excursions at a sampling site, and where data are available, the composition and functional integrity of the biological community. For lakes, support of aquatic life uses is also evaluated using a measure of trophic state. A number of

waterbodies have been given specific standards for pH and dissolved oxygen, which reflect natural conditions.

For assessment purposes, a dissolved oxygen (DO) standard of not less than 4 mg/l is used for Class SB, a standard of not less than 6 mg/l is used for TN and TPGT, and a daily average not less than 5 mg/l with a low of 4 mg/l is used for all other Classes. The term excursion is used to describe a DO concentration measurement of less than the stated standard. Dissolved oxygen and pH may vary from the ranges specified in the standards due to a variety of natural causes.

For pH, there are several acceptable ranges applied depending on the Class of water: 6-8 SU for TPGT; 6-8.5 SU for FW; 5-8.5 SU for FW*; and 6.5-8.5 for SFH, SA, and SB. For DO and pH, if 10 percent or less of the samples contravene the appropriate standard, then aquatic life uses are said to be fully supported. A percentage of standards excursions between 11-25 is considered partial support, and a percentage greater than 25 is considered to represent nonsupport, unless excursions are due to natural conditions.

When comparing sampling data to DO standards, it is necessary to consider sampling bias due to season or tide stage. Samples are collected as a single instantaneous grab sample, which is not truly representative of the daily average used as the criterion for most classifications. Secondary stations are sampled only during summer months and generally experience a higher percentage of DO excursions as a result. It is essential to examine the data to ascertain such patterns of excursions before summarily concluding that the indicated violations constitute poor water quality.

For any individual toxicant (heavy metals, priority pollutants, chlorine, ammonia), if the acute aquatic life standard is exceeded in more than 10 percent of the samples, based on at least ten samples, aquatic life uses are not supported. If the acute aquatic life standard is exceeded more than once, but in less than or equal to 10 percent of the samples, uses are partially supported. If fewer than ten samples were collected, discretion must be used and other factors considered, such as the magnitude of the excursions or number of toxicants with excursions. In such a circumstance, the site is prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation. Biological data are the ultimate deciding factor for determining support of aquatic life uses, regardless of chemical conditions.

MACROINVERTEBRATE DATA INTERPRETATION

Macroinvertebrate community assessments are used, where available, to supplement or verify Aquatic Life Use Support determinations and to evaluate potential impacts from the presence of sediment contaminants. Aquatic and semi-aquatic macroinvertebrates are identified to the lowest practical taxonomic level depending on the condition and maturity of specimens collected. The EPT Index and the North Carolina Biotic Index are the main indices used in analyzing macroinvertebrate data. To a lesser extent, taxa richness and total abundance may be used to help interpret data.

The EPT Index or the Ephemeroptera (mayflies) - Plecoptera (stoneflies) - Trichoptera (caddisflies) Index is the total taxa richness of these three generally pollution-sensitive orders. EPT values are compared with least impacted regional sites. The Biotic Index for a sample is the average pollution tolerance of all organisms collected, based on assigned taxonomic tolerance values. A database is

currently being developed to establish significant EPT index levels to be used in conjunction with the Biotic Index to address aquatic life use support.

Taxa richness is the number of distinct taxa collected and is the simplest measure of diversity. High taxa richness is generally associated with high water quality. Increasing levels of pollution progressively eliminate the more sensitive taxa, resulting in lower taxa richness. Total abundance is the enumeration of all macroinvertebrates collected at a sampling location. This is generally not regarded as a qualitative metric. However, when gross differences in abundance occur between stations this metric may be considered as a potential indicator.

RECREATIONAL USE SUPPORT

The degree to which the swimmable goal of the Clean Water Act is attained (recreational use support) is based on the frequency of fecal coliform bacteria excursions, defined as greater than 400/100 ml for all surface water classes. Comparisons to the bacteria geometric mean standard are not considered appropriate based on sampling frequency and the intent of the standard. If 10 percent or less of the samples are greater than 400/100 ml then recreational uses are said to be fully supported. A percentage of standards excursions between 11-25 percent is considered partial support of recreational uses, and greater than 25 percent is considered to represent nonsupport of recreational uses.

FISH CONSUMPTION USE SUPPORT

The Department uses a risk-based approach to evaluate fish tissue data and to issue consumption advisories in affected waterbodies. This approach contrasts the average daily exposure dose to the reference dose (RfD). Using these relationships, fish tissue data are interpreted by determining the consumption rates that would not be likely to pose a health threat to adult males and nonpregnant adult females. Because an acceptable RfD for developmental neurotoxicity has not been developed, pregnant women, infants, and children are advised to avoid consumption of fish from any waterbody where a mercury advisory was issued.

Fish consumption use support is determined by the occurrence of advisories or bans on consumption for a waterbody. For the support of fish consumption uses, a fish consumption advisory indicates partial use support, a consumption ban indicates nonsupport of uses.

HUMAN HEALTH STANDARDS

State standards for human health are also evaluated in the preparation of the Watershed Water Quality Assessments. For contaminants with human health standards (e.g. heavy metals, pesticides), a potential human health threat is indicated if the median concentration exceeds the standard.

Additional Screening and Prioritization Tools

Evaluation of water quality data and other supplemental information facilitates watershed planning. Information from the following sources is used to develop watershed-based protection and prevention strategies.

LONG-TERM TREND ASSESSMENT

As part of the Watershed Water Quality Assessments, surface data from each station are analyzed for statistically significant long-term trends using a modification of Kendall's tau, which is a nonparametric test removing seasonal effects. Flows are not available for most stations, and the parametric concentrations are not flow-corrected. Seasonal Kendall's tau analysis is used to test for the presence of a statistically significant trend of a parameter, either increasing or decreasing, over a fifteen-year period. It indicates whether the concentration of a given parameter is exhibiting consistent change in one direction over the specified time period. A two sided test at $p=0.1$ is used to determine statistically significant trends, and the direction of trend. An estimate of the magnitude of any statistically significant trend is calculated.

A rigorous evaluation for trends in time-series data usually includes a test for autocorrelation. The data are not tested for autocorrelation prior to the trend analysis. It is felt that autocorrelation would not seriously compromise a general characterization of water quality trends based on such a long series of deseasonalized monthly samples.

One of the advantages of the seasonal Kendall test is that values reported as being below detection limits (DL) are valid data points in this nonparametric procedure, since they are all considered to be tied at the DL value. When the DL changed during the period of interest, all values are considered to be tied at the highest DL occurring during that period. Since it is possible to measure concentrations equal to the value of the DL, values less than DL are reduced by subtraction of a constant so that they remain tied with each other, but are less than the values equal to the DL. Since fecal coliform bacteria detection limits vary with sample dilution, there is no set DL; therefore, for values reported as less than some number, the value of the number is used.

For the purposes of this assessment, long-term trends in selected parameters were examined using data collected from 1984 through 1999. In 1992 a phosphate detergent ban was instituted in South Carolina, so for total phosphorus a second trend assessment is included for the period 1992 through 1999. For total phosphorus it is this second time period that is reported in the text.

SEDIMENT SCREENING

There are no sediment standards; therefore, in order to identify sediments with elevated metals concentrations, percentiles are constructed using five years of statewide sediment data. Only values greater than the detection limit were used for chromium, copper, nickel, lead, and zinc. Because so few concentrations of cadmium and mercury are measured above the detection limit, all samples were pooled for these metals. A sediment metal concentration is considered to be high if it is in the top 10% of the pooled results, and very high if it is in the top 5%. Any analytical result above detection limits is flagged for pesticides, PCBs, and other priority pollutants. Sites with noted high metals concentrations or the occurrence of other contaminants above detection limits are prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

For saltwater sediments, national studies have been conducted by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida that have developed Sediment Quality Guidelines (SQGs) for the United States and the southeastern region. These SQGs summarize all

published toxicology and biomonitoring studies for a given contaminant and ranked them from lowest to highest concentration where an adverse effect was observed. The tenth percentile of the ranked data, from all published studies that reported an adverse effect, is termed the Effects Range Low (ERL) or Threshold Effects Level (TEL) and represents the threshold concentration for toxicity to occur. The median concentration where adverse effects in benthos are observed (the fiftieth percentile) is termed the Effects Range Median (ERM) or Probable Effects Levels (PEL). Measured sediment contaminant levels may be compared with ERLs/ERMs or TELs/PELs to predict potential probability for sediment bound contaminants to cause toxicity in benthic faunal communities. Saltwater sediment contaminant levels were compared with existing sediment quality guidelines by both individual compound. Sites with sediments which had individual chemical contaminant concentrations which exceeded ERL/TEL and ERM/PEL guideline levels are identified to indicate that trace metal, pesticide, PAH or PCB concentrations exceeded levels potentially toxic to estuarine organisms.

WATER COLUMN METALS ANALYSES

The USEPA criteria for heavy metals to protect aquatic life are specified as a four-day average and a one-hour average, and have been adopted as State standards. Because of the quarterly sampling frequency for heavy metals, comparisons to chronic toxicity standards (four-day average concentration) are not considered appropriate; therefore, only the acute standard (one-hour average) for the protection of aquatic life is used in the water quality assessment (Table 1).

Table 1. Metal Standards in Water (µg/l)

Metal	Present Detection Level	Freshwater 1Hr. Acute Ave.	Saltwater 1Hr. Acute Ave.	Human Health
*Cadmium	10.0	1.79	43.0	5.00
Chromium (VI)	10.0	16.00	1100.0	100.00
*Copper	10.0	9.22	2.9	
*Lead	50.0	33.78	140.0	
Mercury	0.2	2.40	2.1	0.15
*Nickel	20.0	789.00	75.0	100.00
*Zinc	10.0	65.00	95.0	5000.00

* Freshwater standards based on a hardness of 50 mg/l as $CaCO_3$.

Zinc and copper are elevated in surface waters statewide and concentrations are frequently measured in excess of the calculated acute aquatic life standards. To identify areas where zinc, copper, and other metals are elevated in the water column above normal background concentrations, concentrations greater than the detection limit from all SCDHEC monitoring sites statewide for a five-year period are pooled and the 90th and 95th percentiles are computed. This is done separately for each metal for both

fresh and saltwaters. The individual measurements from each monitoring station are then compared to these percentiles, as well as to State standards. As in sediments, a metal concentration is referred to as "high" if it is in the top 10% of the pooled results, and "very high" if it is in the top 5%. All water column values referred to as "high" or "very high" are also in excess of the acute aquatic life standard listed in Table 1. For chromium, because so few concentrations are above the detection limit, all samples collected are used to generate the percentiles. Sites with high metals concentrations are prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

The analytical procedures used by the Department yield total metal concentration, which is a relatively conservative measure, since the total metal concentration is always greater than the acid-soluble or dissolved fraction. Most heavy metal criteria for freshwater are calculated from formulas using water hardness. The formulas used to calculate criteria values are constructed to apply to the entire United States, including Alaska and Hawaii. As with all the USEPA criteria, there is also a large margin of safety built into the calculations. The applicability of the hardness-based criteria derived from the USEPA formulas to South Carolina waters has been a subject of much discussion. Hardness values vary greatly nationwide (from zero into the hundreds), with South Carolina representing the lower end of the range (statewide average value is approximately 20 mg/l). Representatives of the USEPA Region IV standards group have stated that no toxicity data for hardness values less than 50 mg/l were used in the development of the formulas. They have expressed reservations about the validity of the formulas when applied to hardness values below 50 mg/l. Based on this opinion, South Carolina's State standards for metals are based on a hardness of 50 mg/l for waters where hardness is 50 mg/l or less, resulting in several criteria values below the Department's current analytical detection limits. Therefore, any detectable concentration of cadmium, copper, or lead is an excursion beyond recommended criteria.

The SCDHEC monitoring data have historically indicated that zinc and copper levels in South Carolina waters are elevated relative to USEPA criteria, apparently a statewide phenomenon in both fresh and salt waters, and possibly resulting from natural conditions, nonpoint sources, or airborne deposition. These levels do not appear to adversely affect state fisheries or macroinvertebrate communities, which suggests that the levels are the result of long-term local conditions to which the fauna have adapted, as opposed to point source pollution events. It is difficult to assess the significance of heavy metal excursions due to the questionable applicability of the formulas at low hardness values and calculated criteria below present detection limits.

NPDES Program

The Water Facilities Permitting Division and the Industrial, Agricultural, and Stormwater Permitting Division are responsible for drafting and issuing National Pollutant Discharge Elimination System (NPDES) permits. Facilities are defined as either "major" or "minor". For municipal permits, a facility is considered a "major" if it has a permitted flow of 1 MGD or more and is not a private facility. The determination for industrial facilities is based on facility and stream characteristics, including toxicity, amount of flow, load of oxygen, proximity of drinking water source, potential to exceed stream standards, and potential effect on coastal waters.

Permitting Process

A completed draft permit is sent to the permittee, the SCDHEC District office, and if it is a major permit, to the USEPA for review. A public notice is issued when the permit draft is finalized. Comments from the public are considered and, if justified, a public hearing is arranged. Both oral and written comments are collected at the hearing, and after considering all information, the Department staff makes the decision whether to issue the permit as drafted, issue a modified permit, or to deny the permit. Everyone who participated in the process receives a notice of the final decision. A copy of the final permit will be sent to anyone who requests it. Staff decisions may be appealed according to the procedures in R.61-72 and the rule of the Administrative Law Judge Division of South Carolina.

The permitting Divisions use general permits with statewide coverage for certain categories of discharges. Discharges covered under general permits include utility water, potable surface water treatment plants, potable groundwater treatment plants with iron removal, petroleum contaminated groundwater, mine dewatering activities, aquaculture facilities, bulk oil and gas terminals, hydrostatic test waters (oil & gas lines), and vehicle wash waters. Additional activities proposed for general permits include ready-mix concrete/concrete products and concentrated animal feeding operations. State Land application systems for land disposal and lagoons are also permitted.

Wasteload Allocation Process

A wasteload allocation (WLA) is the portion of a stream's assimilative capacity for a particular pollutant that is allocated to an existing or proposed point source discharge. Existing WLAs are updated during the basin review process and included in permits during the normal permit expiration and reissuance process. New WLAs are developed for proposed projects seeking a discharge permit or for existing discharges proposing to increase their effluent loading at the time of application. Wasteload allocations for oxygen demanding parameters and nutrients are developed by the Water Quality Modeling Section, and WLAs for toxic pollutants and metals are developed by the appropriate permitting division.

The ability of a stream to assimilate a particular pollutant is directly related to its physical and chemical characteristics. Various techniques are used to estimate this capacity. Simple mass balance/dilution calculations may be used for a particular conservative (nondecaying) pollutant while complex models may be used to determine the fate of nonconservative pollutants that degrade in the environment. Waste characteristics, available dilution, and the number of discharges in an area may, along with existing water quality, dictate the use of a simple or complex method of analysis. Projects that generally do not require complex modeling include: groundwater remediation, noncontact cooling water, mine dewatering, air washers, and filter backwash.

Streams are designated either effluent limited or water quality limited based on the level of treatment required of the dischargers to that particular portion of the stream. In cases where the USEPA published effluent guidelines and the minimum treatment levels required by law are sufficient to maintain instream water quality standards, the stream is said to be effluent limited. Streams lacking the assimilative capacity for a discharge at minimum treatment levels are said to be water quality limited. In cases where better than technology limits are required, water quality, not minimum requirements, controls the permit limits. The Department's Water Quality Modeling Section recommends limits for numerous parameters

including ammonia nitrogen (NH3-N), dissolved oxygen (DO), total residual chlorine (TRC), and five-day biochemical oxygen demand (BOD5). Limits for other parameters, including metals, toxics, and nutrients are developed by the Water Facilities Permitting Division or the Industrial, Agricultural, and Stormwater Permitting Division in conjunction with support groups within the Department.

Nonpoint Source (NPS) Management Program

NPS water pollution, sometimes called "runoff pollution" or "polluted runoff" does not result from a discharge at a specific, single location (or point), but generally comes from diffuse, numerous sources. Runoff occurring after a rain event may transport sediment from plowed fields, construction sites, or logging operations, pesticides and fertilizers from farms and lawns, motor oil and grease deposited on roads and parking lots, or bacteria containing waste from agricultural animal facilities or malfunctioning septic systems. The rain moves the pollutants across the land to the nearest waterbody or storm drain where they may impact the water quality in creeks, rivers, lakes, estuaries, and wetlands. NPS pollution may also impact groundwater when it is allowed to seep or percolate into aquifers. Adverse effects of NPS pollution include physical destruction of aquatic habitat, fish kills, interference with or elimination of recreational uses of a waterbody (particularly lakes), closure of shellfish beds, reduced water supply or taste and odor problems in drinking water, and increased potential for flooding because waterbodies become choked with sediment.

Congress recognized the growing problem of nonpoint source pollution in the late 1980s, and added NPS provisions to the federal law. Section 319 of the 1987 Amendments to the Clean Water Act required states to assess the nonpoint source water pollution associated with surface and groundwater within their borders and then develop and implement a management strategy to control and abate the pollution. The first Assessment of Nonpoint Source Pollution in South Carolina accomplished this purpose. The Department's Bureau of Water manages the ongoing State NPS Management Program, which develops strategies and targets waterbodies for priority implementation of management projects. Section 319 funds various voluntary efforts, including watershed projects, which address many aspects of the pollution prevention management measure and provide education, outreach and technical assistance to various groups and agencies. Most of the projects are implemented by cooperating agencies.

Many land activities can individually or cumulatively contribute to NPS pollution. Eight categories of NPS pollution sources have been identified as contributing to water quality degradation in South Carolina: agriculture, forestry, urban areas, marinas and recreational boating, mining, hydrologic modification, wetlands and riparian areas disturbance, land disposal, and groundwater contamination. There are programs, both regulatory and voluntary, in-place that address all eight categories.

Agriculture

In South Carolina, pesticides, fertilizers, animal waste, and sediment are potential sources of agricultural NPS pollution. Agricultural activities also have the potential to directly impact the habitat of aquatic species through physical disturbances caused by livestock or equipment, and through the management of water. The State has laws and regulations that prevent NPS pollution from several agricultural sources including pesticides and animal waste. Funding programs including those under

section 319 grants from EPA, cost share funds from USDA under EQIP and CRP are used to implement best management practices that are not covered under regulations. Agriculture land acreage is quantified in the basin-wide and individual watershed evaluations.

Silviculture

Forests comprise a major portion of South Carolina's land base. Sixty-six percent, or 12.6 million acres, of the State's total land area is in timberland. Silvicultural practices associated with road access, harvest, and regeneration of timber present the most significant potential for NPS pollution. Silvicultural activities have the potential to degrade the State's waters through the addition of sediment, nutrients, organics, elevated temperature, and pesticides. Erosion and subsequent sedimentation are the most significant and widespread NPS problems associated with forestry practices. Sudden removal of large quantities of vegetation through harvesting or silvicultural practices can also increase leaching of nutrients from the soil system into surface waters and groundwaters. Programs to abate or control NPS pollution from forestry activities are primarily the responsibility of the S.C. Forestry Commission (SCFC) and the United States Department of Agriculture's Forest Service (USFS), with other agencies having supplementary programs. S.C. Forestry Commission provides monthly courtesy exams to SCDHEC's Division of Water Quality and to forest industries. If water quality was impacted by a forestry operation, SCDHEC may institute enforcement action under the South Carolina Pollution Control Act. The United States Department of Agriculture's Natural Resources Conservation Service (USDA-NRCS) also provides technical assistance to government, landowners, and land users. Forest land acreage is quantified in the basin-wide and individual watershed evaluations.

Urban Areas

Urbanization has been linked to the degradation of urban waterways. The major pollutants found in runoff from urban areas include sediment, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. Suspended sediments constitute the largest mass of pollutant loadings to receiving waters from urban areas. Construction sites are a major source of sediment erosion. Nutrient and bacterial sources of contamination include fertilizer usage, pet wastes, leaves, grass clippings, and faulty septic tanks. Petroleum hydrocarbons result mostly from automobile sources. In the 1980's, the average statewide population growth was 11.7 percent, while the coastal counties had an increase of 22 percent, nearly double the State rate during the same time period. This continuing development and population growth has the potential to make urban runoff the most significant source of pollution in waters of the State in the future. Urban land acreage is quantified in the basin-wide and individual watershed evaluations.

SCDHEC has a number of statewide programs that address components of urban NPS pollution. The Bureau of Water (BOW) administers four permitting programs that control runoff from new and existing urban sources. These include the Stormwater and Sediment Reduction program, Municipal Separate Storm Sewer System (MS4), Industrial NPDES Stormwater Permits, and the Section 401 water quality certification program (see p.24). Additional controls for urban runoff in the coastal zone are

implemented by SCDHEC's Oceans and Coastal Resources Management (OCRM) through the State Coastal Zone Management Plan.

The Bureau of Environmental Health's Division of Onsite Wastewater Management administers the Onsite Sewage Disposal System program for the entire State, and oversees the permitting for the installation and management of septic systems. Although not associated with urban land use, this Division permits the septic systems of camping facilities if the facility is not on public sewer. The types of camping facilities that fall into this category through R.61-39 are Resident Camps and Family Camps. Resident camps are organized camps where one or more buildings are provided for sleeping quarters. These camps are typically operated for educational, recreational, religious, or health purposes. Family camps are organized camps where campsites are provided for use by the general public or certain groups. The camp sewage is discharged into a public collection, treatment and disposal system if available, or an onsite wastewater treatment and disposal system (septic tank) is used. Camp locations are identified in the appropriate watershed evaluations.

Marinas and Recreational Boating

Potential adverse environmental impacts associated with marinas include dissolved oxygen deficiencies and high concentrations of toxic metals in aquatic organisms. In addition, marina construction activities can lead to the physical destruction of sensitive ecosystems and bottom-dwelling aquatic communities. Presently, there are more than 100 marinas in South Carolina, with 68 of them in the coastal zone. The U.S. Army Corps of Engineers and the SCDHEC are responsible for permitting marinas in South Carolina. Within SCDHEC, the two offices that have marina permitting authority are the Office of Ocean and Coastal Resource Management (SCDHEC OCRM) and the Office of Environmental Quality Control (SCDHEC Bureau of Water). SCDHEC OCRM issues critical area permits for marinas within the critical area of the coastal zone. SCDHEC Bureau of Water issues permits for marinas at all other locations within the State and issues Section 401 Water Quality Certifications (see p.24) for marinas statewide. The U.S. Coast Guard and the S.C. Department of Natural Resources are responsible for managing recreational boating activity.

Mining

South Carolina's mineral production consists of non-fuel minerals that provide raw materials for construction products and a precious metal industry. Portland cement clays (kaolin and brick), sand and gravel, and crushed stone represent the majority of the total mineral value. At the end of FY 1997-1998, there were 495 mining operations in South Carolina affecting more than 19,000 acres. Surface mining has the potential to generate NPS pollution during mineral exploration, mine development extraction, transportation, mining and processing, product storage, waste disposal, or reclamation. Potential nonpoint source impacts related to mining activities generally include hydrologic modification, erosion and sedimentation, water quality deterioration, fish and wildlife disturbances, and public nuisances.

The Department's Bureau of Land and Waste Management has primary regulatory responsibility for mining activities. Within the Bureau, the Division of Mining and Solid Waste Permitting is responsible for administering and implementing the S.C. Mining Act and its associated regulations. The Mining Act

serves as part of an overall management plan for NPS pollution from active mines. Mining activities and locations are identified in the appropriate watershed evaluations.

Hydromodification

Hydrologic modification (or hydromodification) is defined as stream channelization, channel modification, and dam construction. These activities can negatively impact water quality, destroy or modify in-stream habitat and increase streambank and shoreline erosion. Two State permits, implemented by the SCDHEC, are involved in the implementation of management measures for hydromodification. A critical area permit is required for coastal waters, saltwater wetlands, and beaches defined as critical areas. A navigable waters permit is required for the remainder of the State. Implementation of State policy for dam construction is similar to control of other hydromodification projects in South Carolina, requiring the same State permits and certifications. In addition, dams require a State dam safety permit or a State stormwater management and sediment reduction permit. The Department must also issue Water Quality Certifications pursuant to Section 401 of the Federal Clean Water Act for dam construction and hydropower operations licensed by the Federal Energy Regulatory Commission.

Wetlands

Twenty-three percent of South Carolina is covered by 4.5 million acres of wetlands. The U.S. Army Corps of Engineers implements the federal program for regulating development in wetlands with guidelines established by EPA. The Corps delineates wetlands and determines which wetlands fall under regulatory jurisdiction and require a federal permit for development. The Wetlands Reserve Program, administered by the NRCS, is designed to restore and protect wetlands. At the state level, the primary focus of wetland regulation is the §401 Water Quality Certification. In the §401 certification process, applications for wetland alterations may be denied or modified due to the special nature of a wetland or the functions that a wetland provides. Wetland impacts must be compensated through restoration, enhancement, preservation, or creation and protected in perpetuity. Future development would be prohibited in these mitigated and legally protected areas. Knowledge of areas that are restricted from development due to mitigation or special water classification is useful in planning future development in a watershed. Wetland acreage is quantified in the basin-wide and individual watershed evaluations.

Land Disposal

Although modern solid waste disposal sites are considered point sources of pollution and regulated, leachate from sanitary landfills and dumps have the potential to pollute large portions of adjacent groundwater aquifers. Toxic compounds are commonly a part of the overall composition of landfill leachate, especially when the landfill has been used for the disposal of toxic chemicals. There are currently 140 permitted landfills in South Carolina. This total represents 35 municipal solid waste landfills (MSWLF), 62 industrial waste landfills, 41 construction and demolition (C&D) landfills, one sludge monofill, and one ash monofill. Regulatory authority over solid waste disposal activities resides with SCDHEC's Bureau of Land and Waste Management. All active and closed industrial and municipal solid waste landfills are identified in the appropriate watershed evaluations.

Land application is a form of recycling because it allows recovery of elements needed for crop production. Land application of biosolids may be beneficial and environmentally sound when applied at the correct agronomic rate. Land applying biosolids can benefit farmers by offsetting the costs of fertilizer and lime while reducing the pressure on existing landfills. SCDHEC's Bureau of Water, Division of Water Monitoring, Assessment and Protection, Groundwater Quality Section conducts a program to prevent, monitor, and correct groundwater contamination from nonpoint source pollution from land application of wastewater biosolids, solids, animal manures, biosolids, and sewage sludge. Land application, which is not a discharge, requires a "no discharge" permit (ND). All active industrial and municipal land applications are identified in the appropriate watershed evaluations.

Groundwater Contamination

All aquifers in the State are potential Underground Sources of Drinking Water and are protected under the S.C. Water Classifications and Standards. Groundwaters are thus protected in a manner consistent with the SCDHEC groundwater protection strategy. Staff hydrogeologists implement a screening program for nonpoint source impacts from pits, ponds, and lagoons associated with the permitted storage, treatment, and disposal of industrial and municipal wastewaters. In cases where a groundwater impact has been identified in violation of S.C. Water Classifications and Standards, appropriate actions will be coordinated with the facility owner to ensure regulatory compliance. The hydrogeologist coordinates with the facility owner to implement source identification, contaminant extent assessments, initiation of contaminant remediation systems, and performance evaluations of corrective actions. In addition to releases from wastewater treatment systems, the staff evaluates releases from other nonpoint sources such as above ground tanks, nonregulated fuel oil tanks, spills and/or leaks. Sites with confirmed groundwater impact will be placed under a Consent Agreement or an Order. SCDHEC's South Carolina Groundwater Contamination Inventory quantifies the status of groundwater quality in South Carolina. The sites in the inventory are known groundwater contamination cases in the State, and are referenced by name and county, and updated annually.

Water Supply

Water treatment facilities are permitted by the Department for municipal and industrial potable water production. As per the 1983 Water Use Reporting and Coordination Act (Act 282), all water uses over 100,000 gallons per day must report their usage. This includes industrial, agricultural, mining, golf courses, public supply, commercial, recreational, hydropower, thermo power, and nuclear power activities. Intake location and the volume removed from a stream are identified in the watershed evaluations for municipal (potable) uses.

Consumer Confidence Reports

The Consumer Confidence Report (CCR) is an annual water quality report required of all Community water systems. The rationale behind the CCR is that consumers have a right to know what is in their drinking water and where it comes from. These reports are to educate consumers and help them make informed

choices that affect the health of themselves and their families. It is believed that educated consumers are more likely to protect their drinking water sources. All CCRs are to include the following basic components:

- the water source, its location, and the availability of source water assessment plan;
- information about the water system (name and telephone number of a contact person, opportunities for public participation, and information for non-English speaking populations if applicable);
- definitions of terms and abbreviations used in the report;
- table of detected contaminants including the known or likely source of the contaminants;
- the health effects language for Maximum Contaminant Level violations and an explanation of the violation;
- information on cryptosporidium, radon, and other contaminants if applicable; and
- educational information that includes an explanation of contaminants and their presence in drinking water, an advisory for immuno-compromised people, the Safe Drinking Water Hotline telephone number, and other statements about lead, arsenic, and nitrate if applicable.

Growth Potential and Planning

Land use and management can define the impacts to water quality in relation to point and nonpoint sources. Assessing the potential for an area to expand and grow allows for water quality planning to occur and, if appropriate, increased monitoring for potential impairment of water quality. Indicators used to predict growth potential include water and sewer service, road and highway accessibility, and population trends. These indicators and others were used as tools to determine areas within the Broad River Basin having the greatest potential for impacts to water quality as a result of development.

SCDHEC's Strategic Plan for 2000-2005 (www.scdhec.net/news/releases/pdf files/Stratpln.pdf) acknowledges that growth issues are best handled at the local government level. SCDHEC's role is to work with local governments and communities to help them understand the importance of planning for smart growth: buffers, greenspaces, mass transit, subdivision and roadway planning, bike paths and bike lanes, and park and ride lots. SCDHEC can also provide assistance in helping local entities access information and provide consultation on technical issues such as the establishment of buffers and watershed stormwater planning. Many counties in the Broad River Basin lack county wide zoning ordinances; therefore, there is little local regulatory power to influence the direction or magnitude of regional growth. The majority of municipalities have zoning ordinances in place; however, much of the growth takes place just outside the municipal boundaries, where infrastructure is inadequate. Section 208 of the Clean Water Act serves to encourage and facilitate the development and implementation of areawide waste treatment management plans. The §208 Areawide Water Quality Management Plans were completed in great detail during the 1970's and have recently been updated. Information from the updated reports is used in the individual watershed evaluations. South Carolina's water quality management plans support consolidation of wastewater treatment facilities into larger regional systems.

Watershed boundaries extend along topographic ridges and drain surrounding surface waters. Roads are commonly built along ridge tops with the best drainage conditions. Cities often develop in proximity to ridges as a result of their plateau terrain. It is not uncommon, then, to find cities or road corridors located along watershed boundaries, and thus influencing or impacting several watersheds.

Watershed Protection and Restoration Strategies

SCDHEC's Bureau of Water is responsible for ensuring that South Carolina's water is safe for drinking and recreation, and suitable to support aquatic life. This section provides an overview of other important Bureau programs and strategies applied statewide to protect and restore water quality. The point and nonpoint source controls described previously assist with achieving these goals.

Under section 303(d) of the Federal Clean Water Act, each state is required to provide a comprehensive inventory of impaired waters for which existing required pollution controls are not stringent enough to achieve State water quality standards or Federal Clean Water Act goals. This biennial list, commonly referred to as the "303(d) list", is the basis for targeting waterbodies for watershed-based solutions. A copy of the current 303(d) list can be obtained by contacting the Bureau of Water. Several Bureau programs address these impaired streams in an effort to restore them.

Total Maximum Daily Load

A Total Maximum Daily Load (TMDL) is the calculated maximum allowable pollutant loading to a waterbody at which water quality standards are maintained. A TMDL is made up of two main components, a load allocation and a wasteload allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source.

A TMDL is a means for recommending controls needed to meet water quality standards in a particular water or watershed. Historically, the typical TMDL has been developed as a wasteload allocation, considering a particular waterbody segment, for a particular point source, to support setting effluent limitations. In order to address the combined cumulative impacts of all sources, broad watershed-based TMDLs are now being developed.

The TMDL process is linked to all other State water quality activities. Water quality impairments are identified through monitoring and assessment. Watershed-based investigations result in source identification and TMDL development. TMDLs form links between water quality standards and point and nonpoint source controls. Where TMDLs are established, they constitute the basis for NPDES permits and for strategies to reduce nonpoint source pollution. The effectiveness and adequacy of applied controls are evaluated through continued monitoring and assessment.

Funding for TMDL implementation is currently available with USEPA's Section 319 of the Clean Water Act grants. For more information, see the Bureau of Water web page www.scdhec.net/water or call the Watershed Program at (803) 898-4300.

Antidegradation Implementation

The State's Antidegradation Policy as part of S.C. Regulation 61-68 is represented by a three-tiered approach to maintaining and protecting various levels of water quality and uses; streams included on the 303(d) list are addressed under Tier 1. Tier 1 antidegradation policies apply to all waters of the State

and require that existing uses and the minimum level of water quality for those uses be maintained and protected. Tier 2 policies apply to high quality water where the water quality exceeds the mandatory minimum levels to support the Clean Water Act's goals of propagation of fish, shellfish, wildlife, and recreation in and on the water. The Department considers all the waters of the State as high quality waters. Tier 3 policies apply to the maintenance of water quality in waters that constitute an Outstanding National Resource Water and do not allow for any permanent permitted dischargers. Outstanding Resource Waters of the State are provided a higher level of protection than Tier 2, but do not meet the requirements of Tier 3.

Tier 1 protection will be implemented when applying numeric standards included in Regulation 61-68 for human health, aquatic life, and organoleptic protection as follows: if a waterbody has been affected by a parameter of concern causing it to be on the 303(d) list, then the Department will not allow a permitted net increase of loading for the parameter of concern unless the concentration will not contribute to a violation of water quality standards. This no net increase will be achieved by reallocation of existing total load(s) or by meeting applicable water quality standard(s) at the end-of-pipe. No discharge will be allowed to cause or contribute to further degradation of a 303(d) listed waterbody.

The Antidegradation Rules apply to both nonpoint source pollution and for point sources into impaired waters. Many activities contributing to nonpoint source pollution are controlled with voluntary measures. The Department implements permitting or certification programs for some of these activities and has the opportunity to ensure compliance with the Antidegradation Rules. The activities of primary concern are land development projects which are immediately adjacent to and discharge runoff or stormwater into impaired waters.

401 Water Quality Certification Program

If a Federal permit for a discharge into waters of the State, including wetlands, is required, the Department must issue Water Quality Certification pursuant to Section 401 of the Federal Clean Water Act. Certification is required for permits issued by the U.S. Army Corps of Engineers for construction in navigable waters and for deposition of dredged or fill material.

Regulation 61-101 presents administrative and technical guidance for the water quality certification program and requires SCDHEC to consider whether or not a project is water dependent; whether or not there are feasible alternatives which will have less adverse consequences on water quality and classified uses; the intended purpose of the project; and all potential water quality impacts of the project, both direct and indirect, over the life of the project. Any project with the potential to affect waters of the State must be conducted in such a manner to maintain the specified standards and classified and existing water uses.

As a routine part of the 401 Water Quality Certification review process, the waterbody in question is identified as impaired or not impaired according to the 303(d) list. If it is impaired, the parameter of concern is noted, along with any steps required to prevent further degradation of the water quality of that waterbody. In an effort to facilitate watershed restoration where appropriate, mitigation for unavoidable wetland impacts is encouraged in areas that improve 303(d) listed waters.

Stormwater Program

Stormwater discharges result from precipitation during rain events. Runoff washes pollutants associated with industrial activities (including construction activity), agricultural operations, and commercial and household sites directly into streams, or indirectly into drainage systems that eventually drain into streams. The SCDHEC Stormwater Permitting Program focuses on pollution prevention to reduce or eliminate stormwater pollution. The Department has general permitting authority for stormwater discharges associated with industrial activity, including construction. General permits SCR000000 and SCR100000 for industrial and construction activities, respectively, require permittees to develop and implement stormwater pollution prevention plans that establish best management practices to effectively reduce or eliminate the discharge of pollutants via stormwater runoff. The Stormwater and Agricultural Permitting Section is responsible for issuing NPDES stormwater permits to prevent degradation of water quality as well as for issuing sediment and erosion control permits for construction sites. Currently, NPDES permits are required for construction sites greater than five acres. SCDHEC's Office of Ocean and Coastal Resource Management manages the State sediment and erosion control in the coastal area.

Regulation 61-9 requires a compilation of all existing State water quality data with STORET data being used as a baseline. If analysis indicates a decrease in water quality then corrective measures must be taken. The permittee will identify all impaired water bodies in a Stormwater Management Plan (SWMP). In addition, existing pollution discharge control methods will be identified and incorporated into the SWMP. Procedures, processes, and methods to control the discharge of pollutants from the municipal separate storm sewer system (MS4) into impaired waterbodies and publicly owned lakes included on the 303(d) list will be described in the SWMP. The effectiveness of these controls will be assessed and necessary corrective measures, if any, shall be developed and implemented.

Permits for municipal systems allow communities to design stormwater management programs that are suited for controlling pollutants in their jurisdiction. There are two population-based categories of municipal separate storms sewers: large municipal (population greater than 250,000) and medium municipal (population between 100,000 and 250,000). In the Broad River Basin, Greenville and Richland Counties and the City of Columbia must obtain a comprehensive municipal permit that addresses stormwater within their jurisdiction. These municipalities are defined as medium municipalities.

South Carolina Animal Feeding Operations Strategy

Among the general categories of pollution sources, agriculture ranks as the number one cause of stream and lake impairment nationwide. Many diseases can potentially be contracted from drinking water or coming into contact with waters contaminated with animal wastes. The Department uses S.C. Regulation 61-43: *Standards for the Permitting of Agricultural Animal Facilities* to address the permitting of animal feeding operations (AFOs). Implementing these regulations and their corresponding compliance efforts are a priority for the Department in order to reduce public health and environmental impacts from AFOs. There are currently no federally defined concentrated animal feeding operations (CAFOs) in operation in South Carolina, and approximately 2,000 AFOs. Using the Watershed Program cycle and the division of the State into five regions, AFOs will be monitored and inspected by region. The 303(d) list

will be used to prioritize the inspections. After all the inspections have been made in a region, the Department will move to the river basins in the next region in the watershed cycle. The Department is continuing to work in cooperation and coordination with the U.S. Department of Agriculture, the Natural Resources Conservation Service, the S.C. Department of Agriculture, the S.C. Soil and Water Conservation Districts, and the Clemson Extension Service.

Sanitary Sewer Overflow Strategy

Sanitary sewers are designed to collect municipal and industrial wastewater, with the allowance for some acceptable level of infiltration and inflow, and transport these flows to a treatment facility. When the sewer system is unable to carry these flows, the system becomes surcharged and an overflow will occur. Sanitary sewer overflows (SSOs) have existed since the introduction of separate sanitary sewers, and most are caused by inadequate operation, maintenance, and management of the collection system.

The Department encourages utilities to embrace the principals of EPA's capacity Management, Operations, and Maintenance (cMOM) program. Through this program utilities can ensure adequate funding and capacity as well as a proactive approach to operations and maintenance. Those that have implemented cMOM programs have been able to significantly reduce or eliminate overflows from their collection systems.

The Department's approach has been to shift resources historically applied to treatment plant inspections to include evaluations of pump stations and collection systems where problems are suspected. To assist evaluators in identifying water quality violations related to SSOs, staff have utilized the 303(d) list of impaired waters to identify waters impacted by fecal coliform or other appropriate pollutants and correlate those with collection systems with incidences of SSOs. The Department's Enforcement Referral Procedures Document is be used to determine when a collection system should be referred to enforcement for SSOs. The enforcement process allows for the Department to consider actions taken by the collection system such as: timely and proper notification, containment and mitigation of discharge, voluntarily conducting self evaluations, and requests for compliance assistance. The Department will take immediate action where it has been determined that SSOs have occurred and the collection system has not made timely and proper notification.

Referral Strategy for Effluent Violations

The Department has developed referral effluent violation guidelines to specifically address discharges into impaired waters. The goal of the referral guidelines is to reduce pollutant discharges into impaired waters in order to ultimately restore them to their full potential usage. To achieve this goal, enforcement actions are initiated earlier in an effort to improve the quality of waters that do not meet standards. If a stream is impaired by a pollutant and the permit limit for that pollutant is exceeded more than once in a running annual reporting period, formal enforcement action will be initiated against the discharger.

SCDHEC's Watershed Stewardship Programs

Public participation is an important component of the Department's Watershed Water Quality Management Program. Benefits to this interaction on the local level include improved public awareness about SCDHEC water programs, and increased local interest and participation in water quality improvement. Described below are some of the Department's water programs that encourage public interest and involvement in water quality. These programs and their contacts are listed on the Department's website at www.scdhec.net/water.

Source Water Assessment Program

A safe, adequate source of drinking water is key to development of communities and the health of citizens. The Safe Drinking Water Act (SDWA) provides authority to protect sources of drinking water. As a result of the 1996 amendments to the SDWA, source water protection has become a national priority. States are required to develop a plan for assessment of source waters for all federally defined public groundwater and surface water systems.

The Source Water Assessment Program (SWAP) involves determining the boundaries of the areas that are the source of waters for public water systems. For groundwater systems, these areas are defined using groundwater flow models. For surface water systems, the 14-digit Hydrologic Unit Code watershed is the designated protection area (although certain areas within the basin will be segmented as being of greater vulnerability to contamination from overland flow, groundwater contributions to surface water, and direct spills into the surface water). Known and potential sources of contamination in the delineated area must be identified, and the inventoried sources evaluated to determine the susceptibility of public water systems to such contaminants. Assessments must be made available to the public.

Local involvement will be a critical factor in the success of the SWAP, and local government, citizen groups, environmental groups, water suppliers, and the Department must all work together to increase the general public's awareness of where drinking water comes from and how to better protect sources of drinking water. Implementation of source water protection activities will occur at the local level, and local authorities may wish to base zoning and land-use planning on the source water assessments. The SWAP will be a key part of the Department's watershed management approach. To avoid duplication, information gathered from existing regulatory programs and/or watershed protection efforts will be utilized (e.g., ambient monitoring programs, TMDLs, etc.).

Nonpoint Source Education

The goal of the Nonpoint Source Outreach Program is to educate the citizens of South Carolina about the sources of polluted runoff and techniques that can be used to reduce this runoff. The Program provides presentations on runoff pollution to community, church, civic, or professional groups; a variety of technical and nontechnical publications on runoff pollution and reduction techniques; *Turning the Tide*, a free, quarterly Nonpoint Source newsletter; and teacher training that includes the *Action for a Cleaner Tomorrow* curriculum and information on reducing polluted runoff. To arrange a presentation, order

publications, or ask questions, contact the Nonpoint Source Education coordinator at 803-898-4300 or visit our website.

South Carolina Water Watch

South Carolina Water Watch is a unique effort to involve the public and local communities in water quality protection. The Water Watch program was developed to encourage South Carolina's citizens to become stewards of the State's lakes, rivers, streams, estuaries, and wetlands. Volunteers select a water resource on which to focus and perform activities aimed at protecting water quality, such as shoreline surveys, public education, and litter cleanups. The Water Watch coordinator assists participants with materials and training to help make projects successful. SCDHEC invites individuals, school groups, civic organizations, businesses, and local governments to learn about and protect the quality of our waterways by contacting the Water Watch coordinator at 803-898-4300 or visit our website.

Champions of the Environment

Champions of the Environment is a student recognition program that raises awareness of environmental issues. Nationally recognized for its innovative approach to environmental education, the program promotes hands-on learning by recognizing students working on exemplary environmental projects beyond the realm of the classroom. With scholarships and media coverage, Champions of the Environment encourages student initiative and self-esteem. The program promotes environmental awareness, leadership, conservation, creativity, and self-confidence through activities such as group projects, public speaking, and environmental research. Champions of the Environment is jointly sponsored by Dupont, International Paper, WIS-TV, and SCDHEC. For more information contact the Champions of the Environment coordinator at 803-898-4300 or visit our website.

Clean Water State Revolving Fund

Congress created the Clean Water State Revolving Fund (SRF) in 1987, to replace the §201 Construction Grants program. In doing so, 'state banks' were created to lend money for virtually any type of water pollution control infrastructure project. Project types include construction of wastewater treatment systems and nonpoint source pollution control. The interest rate on the loans is always below the current market rate. As repayments are made on the loans, funds are recycled to fund additional water protection projects. The vast majority of the SRF funds have been used for the construction of traditional municipal wastewater treatment systems. Because of its inherent flexibility, the SRF program is well suited to accommodate the watershed approach.

SRF loans are available to units of state, local, and regional government, and special purpose districts. South Carolina law prevents loans from being made directly to private organizations and individuals. Local governments such as cities and counties and other units of government such as Soil and Water Conservation Districts, Councils of Government, and Water and Sewer Districts are encouraged to apply for SRF loans for nonpoint source projects. Nonpoint source projects may include construction and maintenance of stormwater management facilities, establishment of a stormwater utility, purchase of land for wetlands and riparian zones, and implementation of source water protection assessments. For more information, contact the State Revolving Fund coordinator at 803-898-4300 or visit our website.

Citizen-Based Watershed Stewardship Programs

Throughout the Broad River Basin, water quality is a common interest among citizen groups. The issues and membership of these groups vary widely. Some of the citizen groups interested in water quality in the Broad River Basin are described below.

Friends of Lawsons Fork Creek

The Friends of Lawsons Fork Creek is a citizen advocacy group, founded in 2001, working on behalf of the creek. The group does regular water sampling, sponsors river clean-ups, and hosts events to bring attention to Lawsons Fork Creek. The Friends, which operates under the auspices of the Spartanburg Conservation Endowment SPACE, meets monthly to discuss issues relating to the creek. In 2000, the creek was the subject of a book, The Lawson's Fork: Headwaters to Confluence.

The Scenic Broad River Advisory Council

The 15.3 mile stretch of the Broad River, from 99 Islands Dam to its confluence with the Pacolet River, was designated a Scenic River on May 31, 1991. An advisory council was formed consisting of landowners and representatives from industry and state and local governments. This group published a management plan in August 1993. The advisory council is currently updating the plan that provides recommendations for the management of the Scenic Broad River.

Lake Bowen Home Owners and Boaters Association

The Lake Bowen Home Owners and Boaters Association is a non-profit organization dedicated to promoting a safe and enjoyable environment on and around Lake Bowen by educating the public about safe boating and swimming practices and good environmental practices.

Gilder Creek Watershed Association

The Gilder Creek Watershed Association was organized in 1998 and consists of interested citizens in the watershed. The primary goal of the association is the promotion of more stringent county-level regulation of storm water runoff, chiefly for flood control.

Lovers of the Enoree

Originally founded as a Water Watch group, the Lovers of the Enoree group tries to bring attention to water quality issues concerning the Enoree River. A main focus area for the group is promoting the appropriate use of Best Management Practices (BMPs) on construction sites to help reduce sediment runoff.

Enoree River Basin Description

The ***Enoree River Basin*** encompasses 731.3 square miles that extend across the Piedmont region of the State. The Enoree River Basin encompasses 5 watersheds and 468,025 acres, of which 67.2% is forested land, 11.7% is agricultural land, 10.7% is scrub/shrub land, 9.5% is urban land, 0.7% is barren land, and 0.2% is water. The urban land percentage is comprised chiefly of a portion of the Greenville Metropolitan area. This predominantly rural area has approximately 885.7 stream miles and 1,040.3 acres of lake waters. The Enoree River originates near the City of Travelers Rest and accepts drainage from Beaverdam Creek, Warrior Creek, and Duncan Creek before draining into the Broad River.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region defining the Enoree River Basin is as follows:

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover data for South Carolina was derived from SCDNR 1990 SPOT multispectral satellite images using image mapping software to inventory the State's land classifications, which are as follows.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, as well as vegetated portions of urban areas.

Agricultural/Grass land is characterized by cropland, pasture, and orchards and may include some grass cover in urban, scrub/shrub, and forest areas.

Scrub/Shrub land is adapted from the western Rangeland classification to represent the "fallow" condition of the land (currently unused, yet vegetated), and is most commonly found in the dry Sandhills region including areas of farmland, sparse pines, regenerating forest lands, and recently harvested timber lands.

Forest land is characterized by deciduous and evergreen trees not including forests in wetland settings.

Forested Wetland (swampland) is the saturated bottomland, mostly hardwood forests that are primarily composed of wooded swamps occupying river floodplains and isolated low-lying wet areas, primarily located in Coastal Plain.

Nonforested Wetland (marshland) is dependent on soil moisture to distinguish it from Scrub/Shrub since both classes contain grasses and low herbaceous cover; nonforested wetlands are most common along the coast and isolated freshwater areas found in the Coastal Plain.

Barren land is characterized by an unvegetated condition of the land, both natural (rock, beaches, unvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) includes both fresh and tidal waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Enoree River Basin are described as follows.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Davidson soils are deep, gently sloping to strongly sloping, well drained to somewhat poorly drained soils with a loamy surface layer and a clayey subsoil.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Wilkes soils are dominantly strongly sloping to steep, well drained soils.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Enoree River Basin is from 0.25 to 0.27.

Fish Consumption Advisory

At the time of publication, there are no fish consumption advisories in the Enoree River Basin. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.net/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Enoree River Basin area is 48.5 inches, according to the S.C. historic climatological record. Data compiled from National Weather Service stations in Greenville-Spartanburg WSO Airport, Woodruff, Laurens, Whitmire 2NE, and Newberry were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the spring with 13.58 inches; 12.51, 10.27, and 12.44 inches of rain falls in the summer, fall, and winter, respectively. The average annual daily temperature is 60.9°F. Spring temperatures average 60.9°F and summer, fall, and winter temperatures are 77.6°F, 61.7°F, and 43.5°F, respectively.

Watershed Evaluations

03050108-010

(Enoree River)

General Description

Watershed 03050108-010 is located in Greenville, Spartanburg, and Laurens Counties and consists primarily of the ***Enoree River*** and its tributaries from its origin to Beaverdam Creek. The watershed occupies 167,337 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison series. The erodibility of the soil (K) averages 0.27, and the slope of the terrain averages 10% with a range of 2-25%. Land use/land cover in the watershed includes: 46.5% forested land, 23.1% urban land, 18.8% agricultural land, 10.5% scrub/shrub land, 0.9% barren land, and 0.2% water.

The Enoree River originates near the City of Travelers Rest and accepts drainage from the North Enoree River, Long Branch, Beaverdam Creek, Buckhorn Creek (Buckhorn Lake), Mountain Creek (Mountain Lake, Paris Mountain State Park Lake), Cane Creek, and Princess Creek. Brushy Creek flows through the City of Greenville to enter the river next followed by Rocky Creek (Oak Grove Lake, Shannon Lake, Little Rocky Creek), Dillard Creek, Abner Creek (Vine Creek, Padgett Creek), another Little Rocky Creek, and Peters Creek. Gilder Creek (Earls Lake) originates near the City of Mauldin and is joined by Bridge Fork Creek, Little Gilder Creek, Graze Branch, Horsepen Creek, and Long Branch before flowing into the river downstream of Peters Creek. Hunter Branch enters the river next followed by Buzzard Spring Branch and Lick Creek.

Durbin Creek originates near the City of Simpsonville and accepts drainage from Howard Branch, Wilson Branch, Little Durbin Creek, and South Durbin Creek (Reedy Creek) before draining into the Enoree River. Dildane Creek flows into the river downstream of Durbin Creek and is followed by Brock Page Creek and Boggy Creek. There are several ponds (totaling 343.6 acres) and a total of 321.4 stream miles in this watershed. Paris Mountain State Park is located to the north of the City of Greenville, and all waters within the park are classified ORW. Beaverdam Creek is classified ORW from its headwaters to SR 563; an unnamed tributary to Beaverdam Creek is classified ORW from its headwaters, including the lake, to SR 22; Buckhead Creek is classified ORW from its headwaters, including Buckhorn Lake, to North Buckhorn Road; and an unnamed tributary to Mountain Creek is classified ORW from its headwaters, including Mountain Lake and Paris Mountain State Park Lake, to Mountain Creek. The remaining streams in the watershed are classified FW. There is a Heritage Trust Preserve along the Enoree River just upstream of its confluence with the North Enoree River.

Water Quality

Station #	Type	Class	Description
BE-001	P	FW	ENOREE RIVER AT UNNUMBERED ROAD W OF U.S. 25, N OF TRAVELERS REST
B-797	BIO	FW	ENOREE RIVER AT PINE LOG FORD RD., 2ND CROSSING ABOVE SC 253 BRIDGE

BE-039	S	FW	BEAVERDAM CREEK AT ROAD 1967
B-796	BIO	FW	BEAVERDAM CREEK AT SC 253
B-795	BIO	FW	BUCKHORN CREEK AT SR 562
B-186	S	FW	MOUNTAIN CREEK AT S-23-335
BE-008	BIO	FW	MOUNTAIN CREEK AT SR 279
B-192	P	FW	PRINCESS CREEK AT SUBER MILL RD, SECOND ROAD S OF US 29 OFF S-23-540
BE-015	S	FW	ENOREE RIVER AT COUNTY ROAD 164
BE-035	S/BIO	FW	BRUSHY CREEK AT HOWELL RD (S-23-273), APPROX. 5 MI NE OF GREENVILLE
BE-009	S/BIO	FW	BRUSHY CREEK AT S-23-164
BE-007	S/BIO	FW	ROCKY CREEK AT BATESVILLE BRIDGE, 1 MI ABOVE CONFL. WITH ENOREE R.
B-792	BIO	FW	ABNER CREEK AT BENNETTS RIDGE RD.
BE-017	P	FW	ENOREE RIVER AT SC 296, 7.5 MI NE OF MAULDIN
BE-040	S	FW	GILDER CREEK AT SC 14, ABOVE GILDERS CREEK PLANT
B-241	S	FW	GILDER CREEK AT S-23-142, 2.75 MI ENE OF MAULDIN
B-793	BIO	FW	HORSEPEN CREEK AT SR 145
BE-020	S/BIO	FW	GILDER CREEK AT S-23-143, 1/4 MI ABOVE CONFLUENCE WITH ENOREE RIVER
BE-018	S/BIO	FW	ENOREE RIVER AT S-30-75
BE-019	BIO	FW	ENOREE RIVER AT SC 418
B-037	S	FW	ENOREE RIVER AT S-42-118, SW OF WOODRUFF
B-038	S	FW	LICK CREEK AT S-42-118, 1.25 MI SW WOODRUFF
B-035	S	FW	DURBIN CREEK ON S-23-160, 3 MI E OF SIMPSONVILLE
B-097	P	FW	DURBIN CREEK AT SC 418
BE-022	BIO	FW	DURBIN CREEK AT SC 101
B-040	W	FW	ENOREE RIVER AT S-30-112

Enoree River -There are eight monitoring sites along this section of the Enoree River. At the furthest upstream site ***(BE-001)***, aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standards, including 18 very high concentrations of zinc. The source of the zinc is contaminated groundwater discharging to the river. The contamination originates from the site currently operated by South Atlantic Galvanizing. An initial attempt at groundwater recovery consisted of the installation of a sump pump at a site where groundwater discharge created a spring. The recovered groundwater was pumped back to the facility and used as process water in their production operation. In February of 2001 it was concluded that the amount of groundwater being reprocessed was inadequate to achieve standards compliance in the stream. Additional remediation is planned. A very high concentration of chromium was measured in water in 1998. There is also a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. P,P'DDT and metabolites of DDT(P,P'DDE and P,P'DDD) were detected in the 1995 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there was a significant increasing trend in fecal coliform bacteria concentrations.

At the next site downstream ***(B-797)***, aquatic life uses are partially supported based on macroinvertebrate community data. Further downstream ***(BE-015)***, aquatic life uses are fully supported. There is a significant increasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

At the next downstream site ***(BE-017)***, aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life acute standards. There is a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter. Aquatic life uses are partially supported based on macroinvertebrate community data at the next site downstream ***(BE-018)***. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Further downstream ***(BE-019)***, aquatic life uses are partially supported based on macroinvertebrate community data. At the next site downstream ***(B-037)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the furthest downstream site ***(B-040)***, aquatic life uses are fully supported, but recreational uses are partially supported due to fecal coliform bacteria excursions.

Beaverdam Creek - There are two monitoring sites along Beaverdam Creek. At the upstream site ***(BE-039)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentrations. At the downstream site ***(B-796)***, aquatic life uses are partially supported based on macroinvertebrate community data.

Buckhorn Creek (B-795) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Buckhorn Lake - In an effort to provide access for swimming and fishing, aquatic herbicides were applied in 1994.

Mountain Creek - There are two monitoring sites along Mountain Creek. Aquatic life uses are fully supported at the upstream site ***(B-186)***, and a significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the downstream site ***(BE-008)***, aquatic life uses are partially supported based on macroinvertebrate community data.

Mountain Lake - In an effort to provide access for swimming and fishing, 100 triploid grass carp were stocked in Mountain Lake in 2001.

Princess Creek (B-192) - Aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standards, including a very high concentration of zinc measured in 1995. A very high concentration of lead was measured in 1996. There is also a significant increasing trend in pH. In sediment, a very high concentration of chromium was measured in the 1999 sample and P,P'DDT was detected in the 1996 sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there was a significant increasing trend in fecal coliform bacteria concentrations.

Brushy Creek - There are two monitoring sites along Brushy Creek. At the upstream site ***(BE-035)***, aquatic life uses are partially supported based on macroinvertebrate community data. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the furthest downstream site ***(BE-009)***, aquatic life uses are also partially supported based on macroinvertebrate community data. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. A total maximum daily load (TMDL) has been developed for both BE-035 and BE-009 to address these impairments (see Watershed Protection and Restoration Strategies below).

Rocky Creek (BE-007) - Aquatic life uses are partially supported based on macroinvertebrate community data. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Abner Creek (B-792) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Horsepen Creek (B-793) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Gilder Creek - There are three monitoring sites along Gilder Creek. Recreational uses are not supported at any site due to fecal coliform bacteria excursions that were compounded by a significant increasing trend in fecal coliform bacteria concentrations. Aquatic life uses are fully supported at the upstream site ***(BE-040)***, and a significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. At the next site downstream ***(B-241)***, aquatic life uses are also fully supported. There is a significant increasing trend in pH. A significant increasing trend in dissolved

oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. At the furthest downstream site ***(BE-020)***, aquatic life uses are partially supported based on macroinvertebrate community data. There is a significant increasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters.

Lick Creek (B-038) - Aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Durbin Creek - There are three monitoring sites along Durbin Creek. Aquatic life uses are fully supported at the upstream site ***(B-035)***. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the next site downstream ***(B-097)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the furthest downstream site ***(BE-022)***, aquatic life uses are fully supported based on macroinvertebrate community data.

Natural Swimming Areas

FACILITY NAME *RECEIVING STREAM*	*PERMIT #* *STATUS*
PARIS MOUNTAIN STATE PARK LAKE MOUNTAIN CREEK TRIBUTARY	23-N05 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
ENOREE RIVER CITY OF WOODRUFF PIPE #: 001 FLOW: 0.7	SC0045802 MINOR DOMESTIC EFFLUENT
ENOREE RIVER POLYTECH INC. PIPE #: 001 FLOW: M/R	SCG250062 MINOR INDUSTRIAL EFFLUENT

ENOREE RIVER
NATIONAL STARCH & CHEMICAL CO.
PIPE #: 002 FLOW: 0.12
WQL FOR BOD5,DO,TRC,NH3N

SC0038229
MAJOR INDUSTRIAL
WATER QUALITY

ENOREE RIVER
INMAN MILLS/RAMEY PLANT
PIPE #: 001 FLOW: 0.05
WQL FOR BOD5,DO,TRC,NH3N

SC0002496
MINOR INDUSTRIAL
WATER QUALITY

ENOREE RIVER
WCRSA/TAYLORS AREA PLANT
PIPE #: 001 FLOW: 7.5
WQL FOR BOD5,DO,TRC,NH3N
TO BE ELIMINATED (TIED INTO WCRSA/PELHAM PLT

SC0024309
MAJOR DOMESTIC
WATER QUALITY

ENOREE RIVER
WCRSA/PELHAM PLANT WWTP
PIPE #: 001 FLOW: 7.5 (EXPANDING TO 22.5MGD)
WQL FOR BOD5,DO,TRC,NH3N
SCHEDULED FOR EXPANSION (INCORPORATING TAYLORS PLT)

SC0033804
MAJOR DOMESTIC
WATER QUALITY

ENOREE RIVER
WCRSA/GILDER CREEK
PIPE #: 001 FLOW: 4.0
PIPE #: 001 FLOW: 5.0, 8.0, 12.0 (PROPOSED)
WQL FOR BOD5,DO,TRC,NH3N

SC0040525
MAJOR DOMESTIC
WATER QUALITY
WATER QUALITY

ENOREE RIVER
GREENWOOD HOLDING CORP./GREER
PIPE #: 001 FLOW: 0.03
WQL FOR BOD5,DO

SC0042056
MINOR INDUSTRIAL
WATER QUALITY

ENOREE RIVER TRIBUTARY
BUCK-A-ROO RANCH INC.
PIPE #: 001 FLOW: 0.0101
WQL FOR TRC,NH3N

SC0026662
MINOR DOMESTIC
WATER QUALITY

BEAVERDAM CREEK TRIBUTARY
WCRSA/COACHMAN ESTATES
PIPE #: 001 FLOW: 0.025
WQL FOR BOD5,DO,TRC,NH3N

SC0024040
MINOR DOMESTIC
WATER QUALITY

MOUNTAIN CREEK
ALTAMONT FOREST
PIPE #: 001 FLOW: 0.0124
WQL FOR TRC,NH3N

SC0034398
MINOR DOMESTIC
WATER QUALITY

MOUNTAIN CREEK
MORTON INTERNATIONAL, INC.
PIPE #: 001 FLOW: M/R

SCG250097
MINOR INDUSTRIAL
EFFLUENT

PRINCESS CREEK
CLIFFSTAR CORP./GREER
PIPE #: 001 FLOW: M/R

SCG250047
MINOR INDUSTRIAL
EFFLUENT

PRINCESS CREEK
EXIDE/GENERAL BATTERY CORP.
PIPE #: 001 FLOW: M/R

SC0042633
MINOR INDUSTRIAL
EFFLUENT

PRINCESS CREEK TEXTRON/GREER GROUNDWATER TRT. SYS. PIPE #: 001 FLOW: M/R	SC0047988 MINOR INDUSTRIAL EFFLUENT
BRUSHY CREEK LIBERTY LIFE INSURANCE CO. PIPE #: 001 FLOW: 0.03	SCG250166 MINOR INDUSTRIAL EFFLUENT
ROCKY CREEK TRIBUTARY NYCOIL COMPANY/DM DIV. PIPE #: 001 FLOW: M/R	SCG250061 MINOR INDUSTRIAL EFFLUENT
ROCKY CREEK TRIBUTARIES GE/GREENVILLE GAS TURBINE PLT PIPE #: 001 FLOW: 0.45 PIPE #: 010 FLOW: M/R PIPE #: 011 FLOW: M/R	SC0003484 MINOR INDUSTRIAL EFFLUENT EFFLUENT EFFLUENT
VINE CREEK HANSON AGGREGATE/PELHAM QUARRY PIPE #: 001 FLOW: M/R	SCG730042 MINOR INDUSTRIAL EFFLUENT
PADGETT CREEK SSSD/HIGHWAY 101 BUSINESS PARK PIPE #: 001 FLOW: 0.03-0.04 WQL FOR BOD5,DO,TRC; NH3N IN SUMMER & WINTER	SC0047350 MINOR DOMESTIC WATER QUALITY
BRIDGE FORK CREEK METROMONT MATERIALS/MAULDIN PIPE #: 001 FLOW: 0.002	SC0038016 MINOR INDUSTRIAL EFFLUENT
DURBIN CREEK WCRSA/DURBIN CREEK PLT PIPE #: 001 FLOW: 3.3 WQL FOR BOD5,DO,TRC,NH3N	SC0040002 MAJOR DOMESTIC WATER QUALITY
DURBIN CREEK PARA-CHEM SOUTHERN, INC. PIPE #: 001 FLOW: M/R	SCG250117 MINOR INDUSTRIAL EFFLUENT
LITTLE ROCKY CREEK BROCKMAN CATFISH FARM PIPE #: 001 FLOW: 0.1 WQL FOR BOD5,DO	SCG130007 MINOR INDUSTRIAL WATER QUALITY

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
CAMP BUCKHORN/RESIDENT BUCKHORN CREEK	23-305-0127 ACTIVE

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
ENOREE SANITARY LANDFILL DOMESTIC	231001-1101 (231001-1201, CWP-040) CLOSED
ENOREE C/D LANDFILL DOMESTIC	DWP-088 (231001-1201, CWP-040) CLOSED
ENOREE LANDFILL DOMESTIC	231001-1102 (231001-1201, CWP-040) ACTIVE
R. FALCON LANDFILL DOMESTIC	302900-1301 ———
GENERAL ELECTRIC INDUSTRIAL	IWP-232 (SCD049126097) ———
GENERAL ELECTRIC CONSTRUCTION	233321-1201 (CWP-035) ———
STEELE HEDDLE INDUSTRIAL	IWP-171 (SCD002267490) ———
BAHAN MACHINE & FOUNDRY CO., INC. INDUSTRIAL	IWP-008 (SCD987566767) ———

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD WCRSA/DURBIN CREEK PLANT	SC0040002 DOMESTIC

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
PELHAM STONE CO. PELHAM QUARRY	0431-83 GRANITE
COGDILL & LAWSON COGDILL & LAWSON MINE	0875-83 SAND (RIVER DREDGE)
BROWN BROWN'S GENERAL PERMIT MINE	1191-83 SAND/CLAY, TOPSOIL
BROWN #2 BROWN SAND MINE #2	0861-59 SAND

Growth Potential

There is a high potential for residential, commercial, and industrial growth in this watershed, which contains the eastern portion of the greater Greenville area, a portion of the City of Greer, and the Cities of Travelers Rest, Mauldin, Fountain Inn, Simpsonville, and Woodruff. The expansion of the Greenville-Spartanburg Airport and highway improvements around the airport and connecting Greenville to the City of Greer and on to the City of Spartanburg will stimulate continued industrial growth between S.C. Hwy. 101, S.C. Hwy. 417, the Enoree River, and S.C. Hwy. 14. Future industrial development will be prevalent along I-385. The City of Woodruff should also experience industrial, commercial, and residential growth.

The area to the north of the City of Greenville is effectively excluded from development by residing in the Paris Mountain State Park. Through the initiative of the Friends of Paris Mountain, the Greenville Water System has recently donated an additional 260 additional acres to the Park Service. This urban wilderness area is limited to low-impact uses (hiking and trailside camping).

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A total maximum daily load (TMDL) for fecal coliform has been developed for Brushy Creek, a tributary of the Enoree River, which flows through the City of Greenville. Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Between 1991 and 1995, 95% of the samples collected at station BE-035 and 70% of samples collected at station BE-009 exceeded the 400 colonies/100ml standard. Targeting urban land for reduction of bacteria is the most effective strategy for this watershed.

A target level of bacteria of 175 colonies/100mlwas established. This translates to an urban bacteria-loading reduction of 73% at BE-009 and an urban bacteria-loading reduction of 89% at BE-035. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use.

There are several tools available for implementing this TMDL, including Nonpoint Source (NPS) pollution outreach activities and materials and coverage under Greenville County's stormwater permit. SCDHEC will continue to monitor water quality in Brushy Creek to evaluate the effectiveness of these measures.

Funding for TMDL implementation activities is currently available. For more information, see the Bureau of Water web page www.scdhec.net/water or call the Watershed Program at (803) 898-4300.

Special Projects

Urban Watershed Protection and Enhancement through Stewardship and Education

The objective of this project, funded by a USEPA Section 319 grant of the Clean Water Act and currently being implemented by Clemson University, is to develop stewardship of urban-rural watersheds located in two major metropolitan areas of northwestern South Carolina. Princess Creek in Greenville County and Lawsons Fork Creek in Spartanburg County are targeted for the project efforts. Fecal

coliform bacteria is a major concern in both watersheds. Sources of fecal coliform bacteria may be traced to mini-farms, faulty septic systems, wild animals, or improper housing and management of family pets. It may also enter creeks when the capacity of municipal waste treatment facilities is exceeded. Exceeding treatment capacity may be due to major rainfall events adding water to the system or when population growth and waste input exceeds waste treatment capacity. This occurs in watersheds that experience rapid urban, suburban, and rural development such as the Upstate region of South Carolina.

The strategy is to develop a grass roots movement in watersheds where none presently exists, educate stakeholders and managers on water quality protection and proper watershed management. Specifically, the strategy has a monitoring program and several Community Involvement and Education objectives. Volunteer stream monitoring teams will be developed to foster stewardship in targeted watersheds. Stream teams will be developed from area schools where programs like Adopt-a Stream will be made available. Existing civic, environmental groups, and other interested citizen groups will be provided presentations to develop stewardship interests. Educational materials will be developed for the specific areas of concern that were defined by the monitoring program, and will include Farm/Home-a-Syst type materials for pollution prevention. The Stewardship group, with the direction of the lead contact and the assistance of NRCS and Conservation District personnel, will develop a community water quality newsletter, and provide water quality educational materials at existing river/water fairs and city festivals.

Scale Effects on Chemical Flux and Fecal Coliform Counts in the Enoree River Watershed

A project currently underway by Furman University is monitoring water quality in the upper Enoree River basin over a period of three years, and at different points within the watershed, to determine the effects of spatial and temporal scale, land use patterns, and landscape configuration on water quality. To assess this, several watersheds of varying size (3 km^2 to 1150 km^2) and reflecting various land uses are being sampled on a weekly or biweekly basis. Monitoring sites include two existing USGS gauging stations and an additional one that drains to Mountain Lake in Paris Mountain State Park.

Previous work suggests that watershed scale plays an important role in variations in water quality, but few studies have connected multiple water quality factors across several spatial and temporal scales. Correlation of land use, water quality change, and spatial-temporal scale may distinguish between sources of solutes and bacteria and the times of year that they are most prevalent. Such results would be important for determining how to best manage water quality.

The results of the study will be disseminated at the Roper Mountain Science Center's summer science teacher workshops in Greenville and neighboring counties. The data will also be used in various science classes at Furman University.

03050108-020

(Enoree River)

General Description

Watershed 03050108-020 is located in Spartanburg, Laurens, and Union Counties and consists primarily of the ***Enoree River*** and its tributaries from Beaverdam Creek to Duncan Creek. The watershed occupies 83,425 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes series. The erodibility of the soil (K) averages 0.25, and the slope of the terrain averages 18%, with a range of 2-45%. Land use/land cover in the watershed includes: 81.7% forested land, 11.4% scrub/shrub land, 5.5% agricultural land, 0.9% urban land, 0.4% barren land, and 0.1% water.

This segment of the Enoree River accepts drainage from its upstream reach, together with the Beaverdam Creek Watershed, Twomile Creek (Hannah Creek), Buckhead Creek, the Warrior Creek Watershed, Enoree Creek, and Cedar Shoals Creek. Elishas Creek enters the river next followed by Frenchman Creek, Johns Creek (Wildcat Branch), Sispring Branch, and Hills Creek. There are several ponds (totaling 66.5 acres) and a total of 181.9 stream miles in this watershed, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
B-041	P	FW	ENOREE RIVER AT SC 49, SE OF WOODRUFF
B-785	BIO	FW	CEDAR SHOALS CK AT UNNAMED RD 0.2 KM ABOVE CONFL.W/ENOREE R.
B-053	W	FW	ENOREE RIVER AT SC 72, 121, & US 176, 1 MI NE WHITMIRE

Enoree River - There are two monitoring sites along this section of the Enoree River. At the furthest upstream site ***(B-041),*** aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standards, including a very high concentration of zinc in 1996. A very high concentration of chromium was measured in water in 1998 and a very high concentration of cadmium was measured in 1999. There is also a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. At the downstream site ***(B-053),*** aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

Cedar Shoals Creek (B-785) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
ENOREE RIVER RIVERDALE MILLS W&S DISTRICT PIPE #: 001 FLOW: 0.09 WQL FOR BOD5,DO,TRC,NH3N	SC0035734 MINOR DOMESTIC WATER QUALITY
ENOREE RIVER WR GRACE/SUMMER MINE PIPE #: 001 FLOW: M/R	SCG730001 MINOR INDUSTRIAL EFFLUENT
ENOREE RIVER TOWN OF WHITMIRE WTP PIPE #: 001 FLOW: M/R	SCG645046 MINOR DOMESTIC EFFLUENT
ENOREE CREEK CAROLINA VERMICULITE PIPE #: 001 FLOW: M/R	SCG730013 MINOR INDUSTRIAL EFFLUENT
ENOREE CREEK WR GRACE/DESHIELDS 1&2 MINE PIPE #: 001 FLOW: M/R	SCG730092 MINOR INDUSTRIAL EFFLUENT
BUCKHEAD CREEK WR GRACE/ROPER MINE PIPE #: 001 FLOW: M/R	SCG730089 MINOR INDUSTRIAL EFFLUENT
BUCKHEAD CREEK TRIBUTARY WR GRACE/KEARNEY MILL SITE PIPE #: 001 FLOW: M/R	SC0045811 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
MILLIKEN & CO. - ENTERPRISE PLANT INDUSTRIAL	422433-1601 (SCD000824862) ---
NATIONAL STARCH INDUSTRIAL	IWP-107 (SCD070364922) CLOSED
NATIONAL STARCH INDUSTRIAL	IWP-146 (SCD070364922) CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CAROLINA VERMICULITE NUMBER 8 MINE	1034-59 VERMICULITE
CAROLINA VERMICULITE BROWN #2 MINE	0623-83 VERMICULITE
WR GRACE & CO. SUMNER MINE	0714-59 VERMICULITE
WR GRACE & CO. WRIGHT #1 & 2	0278-59 VERMICULITE
WR GRACE & CO. DESHIELDS #1 & #2 MINE	1019-83 VERMICULITE ORE
WR GRACE & CO. BOYD-WHITMORE MINE	1118-59 VERMICULITE ORE
CAROLINA VERMICULITE DONNAN #1 MINE	1164-59 VERMICULITE
PATTERSON VERMICULITE CO. PATTERSON #3 MINE	0048-59 VERMICULITE
WR GRACE & CO. SCHUMACHER MINE	0907-83 VERMICULITE
WR GRACE & CO. WATSON MINE	1023-83 VERMICULITE ORE
WR GRACE & CO. GIDEON MINE	0833-83 VERMICULITE
RAY BROWN ENTERPRIZES BROWN MINE #2	0861-83 SAND
CAROLINA VERMICULITE LAURENCE MINE	1048-87 VERMICULITE ORE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF CLINTON ENOREE RIVER	3.5 1.7
TOWN OF WHITMIRE ENOREE RIVER	2.2 1.0

Growth Potential

There is some potential for growth in the upper portion of this watershed near the Town of Enoree, associated with industrial development along U.S. Hwy. 221. The watershed is bisected by I-26 and some growth may be expected around the interstate interchanges. A commercial corridor has developed along U.S. Hwy. 176 and S.C. Hwy. 72 located in the lower region of the watershed, which serves the Whitmire community. Public water is available, but little growth is expected.

03050108-030

(Beaverdam Creek/Warrior Creek)

General Description

Watershed 03050108-030 is located in Laurens County and consists primarily of ***Beaverdam Creek and Warrior Creek*** and their tributaries. The watershed occupies 35,247 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison-Davidson-Pacolet series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 56.7% forested land, 20.1% scrub/shrub land, 18.8% agricultural land, 1.8% urban land, 1.6% barren land, and 1.0% water.

Beaverdam Creek flows into the Enoree River near the Town of Enoree and further downstream Warrior Creek enters the river. Beaverdam Creek accepts drainage from Wallace Branch and Warrior Creek accepts drainage from Double Branch and Strouds Branch. There are several ponds and lakes (totaling 342.4 acres) and a total of 64.2 stream miles in this watershed, all classified FW.

Water Quality

Station #	Type	Class	Description
B-246	W/BIO	FW	BEAVERDAM CREEK AT S-30-97, 7 MI NE OF GRAY COURT
B-150	W	FW	WARRIOR CREEK AT US 221, 8 MI NNE OF LAURENS
B-742	BIO	FW	WARRIOR CREEK AT SC 49

Beaverdam Creek (B-246) - Aquatic life uses are fully supported based on macroinvertebrate community data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Warrior Creek - There are two monitoring sites along Warrior Creek. At the upstream site ***(B-150),*** aquatic life uses are fully supported. A high concentration of zinc and a very high concentration of cadmium were measured in 1999, and a very high concentration of chromium was measured in 1995. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the downstream site ***(B-742),*** aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / ***FACILITY NAME*** / ***PERMITTED FLOW @ PIPE (MGD)*** / ***COMMENT***	***NPDES#*** / ***TYPE*** / ***LIMITATION***
BEAVERDAM CREEK VULCAN MATERIALS CO./GRAY COURT PIPE #: 001 FLOW: M/R	SCG730055 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
SOUTHEASTERN ASSOCIATES - LAURENS INDUSTRIAL	302428-1201 ---

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CAROLINA VERMICULITE CHARLES WALDREP	0970-59 VERMICULITE
VULCAN MATERIALS CO. GRAY COURT QUARRY	0061-59 GRANITE
WR GRACE & CO. F. WALDREP MINE	1022-59 VERMICULITE ORE
WR GRACE & CO. WRIGHT NO. 1 & 2	0278-59 VERMICULITE
WR GRACE & CO. TEMPLETON MINE	1160-59 VERMICULITE
WR GRACE & CO. DAVIS-DEWITT MINE	1018-59 VERMICULITE ORE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the Town of Gray Court. I-385 crosses the watershed and some industrial growth may be expected around interstate interchanges.

03050108-040

(Duncan Creek)

General Description

Watershed 03050108-040 is located in Laurens and Newberry Counties and consists primarily of ***Duncan Creek*** and its tributaries. The watershed occupies 76,743 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Madison-Pacolet series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 16%, with a range of 2-45%. Land use/land cover in the watershed includes: 74.9% forested land, 12.4% scrub/shrub land, 7.1% agricultural land, 4.5% urban land, 0.7% barren land, and 0.4% water.

Duncan Creek originates near the Town of Ora and accepts drainage from Duncan Creek Reservoir 6B (73 acres), Long Branch, Saxton Branch, Beards Fork Creek, Millers Fork (Sand Creek), and Allisons Branch. Beards Fork Creek and Millers Fork enter Duncan Creek near the City of Clinton. Further downstream near the Town of Whitmire, South Fork Duncan Creek (Ned Wesson Branch) enters Duncan Creek followed by Mulberry Branch and Sandy Branch. There are several ponds and lakes (totaling 231.4 acres) and a total of 134.1 stream miles in this watershed, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
B-735	W	FW	DUNCAN CREEK RESERVOIR 6B
B-231	S	FW	BEARDS FORK CREEK AT US 276 (I-385), 3.7 MI NNE OF CLINTON
B-072	P/BIO	FW	DUNCAN CREEK AT US 176, 1.5 MI SE OF WHITMIRE

Duncan Creek (B-072) - Aquatic life uses are fully supported based on macroinvertebrate community data. A very high concentration of zinc was measured in 1995 and a very high concentration of chromium was measured in 1997. Recreational uses are not supported due to fecal coliform bacteria excursions.

Duncan Creek Reservoir 6B (B-735) - Duncan Creek Reservoir 6B is a 73-acre impoundment near the headwaters of an unnamed tributary to Duncan Creek near the top of the watershed in Laurens County. The maximum depth is approximately 15 feet (4.5 m) and the average depth is 5.4 feet (1.7 m). The reservoir's watershed comprises approximately 0.8 square miles (2 km2). Aquatic life uses are partially supported due to pH excursions. Recreational uses are fully supported.

Beards Fork Creek (B-231) - Aquatic life uses are not supported due to dissolved oxygen excursions. There is also a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentration.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
DUNCAN CREEK TOWN OF WHITMIRE PIPE #: 001 FLOW: 0.6 (PHASE I) PIPE #: 001 FLOW: 1.0 (PHASE II) WQL FOR TRC	SC0022390 MINOR DOMESTIC WATER QUALITY WATER QUALITY
DUNCAN CREEK WR GRACE/BALL MINE PIPE #: 001 FLOW: M/R	SCG730029 MINOR INDUSTRIAL EFFLUENT
BEARDS FORK CREEK CLINTON MILLS/BAILEY PLT PIPE #: 001 FLOW: 0.101 PIPE #: 002 FLOW: M/R	SCG250146 MINOR INDUSTRIAL EFFLUENT EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CLINTON MILLS - BAILEY PT DOMESTIC	DWP-019 (SCD0033415575) CLOSED
CITY OF CLINTON DOMESTIC	301002-1201(DWP-914) CLOSED (SCD002394104)
CITY OF CLINTON DOMESTIC	DWP-026 CLOSED
LAURENS COUNTY SW TRANSFER STA. DOMESTIC	302401-6001 ———
LAWNDALE MOBILE HOMES INDUSTRIAL	IWP-101 ———

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WR GRACE & CO. GOODWIN MINE	0692-59 VERMICULITE
WR GRACE & CO. BALL MINE	0748-59 VERMICULITE
WR GRACE & CO. BLAKELY MINE	1166-59 VERMICULITE CRUDE ORE

WR GRACE & CO. LEONARD MINE	0835-59 VERMICULITE
WR GRACE & CO. COOPER #1 & #2	1064-59 VERMICULITE ORE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD))*
CITY OF CLINTON DUNCAN CREEK	3.5 1.7
TOWN OF WHITMIRE DUNCAN CREEK	1.0 1.0

Growth Potential

There is a high potential for industrial growth in this watershed, which contains the City of Clinton and portions of the Cities of Whitmire and Laurens. I-26 and I-385 intersect near Clinton and future industrial development will be prevalent along I-385 to the area south of Clinton.

03050108-050

(Enoree River)

General Description

Watershed 03050108-050 is located in Newberry and Laurens Counties and consists primarily of the ***Enoree River*** and its tributaries from Duncan Creek to its confluence with the Broad River. The watershed occupies 105,272 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodibility of the soil (K) averages 0.25, and the slope of the terrain averages 13%, with a range of 2-40%. Land use/land cover in the watershed includes: 86.2% forested land, 6.2% agricultural land, 6.1% scrub/shrub land, 1.0% urban land, 0.2% barren land, 0.2% forested wetland, and 0.1% water.

This segment of the Enoree River accepts drainage from its upstream reaches, together with Sulphur Spring Branch, Collins Branch, and Indian Creek. Indian Creek originates near the Town of Joanna and accepts drainage from Fort Branch, Loftons Branch, Locust Branch, Long Branch (Buncombe Branch), Headleys Creek (Peges Creek), Pattersons Creek, Asias Branch, Gilders Creek (Johns Mountain Branch, Joshuas Branch), and Hunting Creek. South Fork Kings Creek (Little Kings Creek, Means Branch) enters the river near the City of Newberry followed by Fosters Branch, Quarters Branch, and Subers Creek. There are several ponds and lakes (totaling 56.5 acres) and a total of 183.1 stream miles in this watershed, all classified FW. The entire watershed resides within the Sumter National Forest and the Enoree River Waterfowl Area is located near the confluence with the Broad River.

Water Quality

Station #	Type	Class	Description
B-071	BIO	FW	INDIAN CREEK AT US 176
B-799	BIO	FW	KINGS CREEK AT US 176, DOWNSTREAM OF BRIDGE
B-054	P	FW	ENOREE RIVER AT S-36-45, 3.5 MI ABOVE CONFLUENCE WITH BROAD R.

Enoree River (B-054) – Aquatic life uses are not supported due to occurrences of chromium in excess of the aquatic life acute standards, including very high concentrations of chromium measured once each in 1996 and 1999. A significant decreasing trend in dissolved oxygen concentrations and significant increasing trends in five-day biochemical oxygen demand and turbidity suggest degrading conditions for these parameters. In water, diethyl phthalate was measured in 1997. In sediments, di-n-octylphthalate and di-n-butylphthalate were measured in 1995 and bis(2-ethylhexyl)phthalate was measured in 1997. Recreational uses are not supported due to fecal coliform bacteria excursions.

Kings Creek (B-799) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Indian Creek (B-071) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
HEADLEYS CREEK JOANNA KOA PIPE #: 001 FLOW: 0.010 WQL FOR BOD5,DO,TRC,NH3N	SC0024732 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
SHAKESPEARE LANDFILL - NEWBERRY INDUSTRIAL	IWP-159

Growth Potential

There is a low potential for growth in this watershed, which contains the Town of Joanna. The watershed is effectively excluded from development by residing in the Sumter National Forest.

Tyger River Basin Description

The ***Tyger River Basin*** encompasses 807.9 square miles extending across the Piedmont region of the State. The Tyger River encompasses 6 watersheds and 517,056 acres, of which 67.1% is forested land, 13.7% is agricultural land, 9.9% is urban land, 8.1% is scrub/shrub land, 0.7% is water, and 0.5% is barren land. The urban land percentage is comprised chiefly of the City of Greer and portions of the Cities of Spartanburg and Union. There are approximately 937.9 stream miles and 2,889.1 acres of lake waters in the Tyger River Basin. The Tyger River is formed by the confluence of the South Tyger River, the Middle Tyger River, and the North Tyger River near the City of Woodruff and accepts drainage from Fairforest Creek before flowing into the Broad River.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region that defines the Tyger River Basin is as follows:

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover data for South Carolina was derived from SCDNR 1990 SPOT multispectral satellite images using image mapping software to inventory the State's land classifications, which are as follows.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, as well as vegetated portions of urban areas.

Agricultural/Grass land is characterized by cropland, pasture, and orchards and may include some grass cover in urban, scrub/shrub, and forest areas.

Scrub/Shrub land is adapted from the western Rangeland classification to represent the "fallow" condition of the land (currently unused, yet vegetated), and is most commonly found in the dry Sandhills region including areas of farmland, sparse pines, regenerating forest lands, and recently harvested timber lands.

Forest land is characterized by deciduous and evergreen trees not including forests in wetland settings.

Forested Wetland (swampland) is the saturated bottomland, mostly hardwood forests that are primarily composed of wooded swamps occupying river floodplains and isolated low-lying wet areas, primarily located in the Coastal Plain.

Nonforested Wetland (marshland) is dependent on soil moisture to distinguish it from scrub/shrub since both classes contain grasses and low herbaceous cover; nonforested wetlands are most common along the coast and isolated freshwater areas found in the Coastal Plain.

Barren land is characterized by an unvegetated condition of the land, both natural (rock, beaches and unvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest).

Water (non-land) includes both fresh and tidal waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Tyger River Basin are described as follows.

Cataula soils are deep, gently sloping to strongly sloping, well drained soils with a loamy surface layer and a clayey subsoil.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Davidson soils are deep, gently sloping to strongly sloping, well drained to somewhat poorly drained soils with a loamy surface layer and a clayey subsoil.

Enon soils are well drained to somewhat poorly drained, shallow to deep soils, mainly brownish, firm to extremely firm clay loam to clay in the subsoil, on narrow and medium ridges.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Wilkes soils are dominantly strongly sloping to steep, well-drained soils.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Tyger River Basin is from 0.24 to 0.29.

Fish Consumption Advisory

At the time of publication, there are no fish consumption advisories in the Tyger River Basin. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.net/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Tyger River Basin area is 49.41 inches, according to the S.C. historic climatological record. Data compiled from National Weather Service stations in Greenville-Spartanburg WSO Airport, Spartanburg 3E, Woodruff, Union 8SW, and Whitmire 2NE were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the spring with 13.66 inches; 12.60, 10.52, and 12.63 inches of rain falls in the summer, fall, and winter, respectively. The average annual daily temperature is 60.8°F. Spring temperatures average 59.6°F and summer, fall, and winter temperatures are 76.7°F, 60.8°F, and 46.3°F, respectively.

Watershed Evaluations

03050107-010

(South Tyger River)

General Description

Watershed 03050107-010 is located in Greenville and Spartanburg Counties and consists primarily of the ***South Tyger River*** and its tributaries. The watershed occupies 110,015 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Cataula series. The erodibility of the soil (K) averages 0.29, and the slope of the terrain averages 8%, with a range of 2-25%. Land use/land cover in the watershed includes: 59.2% forested land, 20.4% agricultural land, 9.7% urban land, 8.1% scrub/shrub land, 1.5% water, and 1.1% barren land.

Mush Creek (Johnson Creek, Dysort Lake, Meadow Fork), Barton Creek (McKinney Creek also known as Burban Fork Creek, Noe Creek), and Pax Creek join to form the South Tyger River near Pax Mountain. Just downstream of the confluence the South Tyger River is impounded to form Lake Robinson. Downstream of Lake Robinson, the South Tyger River is joined by Beaverdam Creek and forms Lake Cunningham (Clear Creek). Downstream from Lake Cunningham near the City of Greer, the river accepts drainage from Frohawk Creek, Wards Creek, and Maple Creek. The river then flows through Berrys Pond (60 acres) and accepts drainage from 58 acre-Silver Lake (Williams Creek), Brushy Creek (Powder Branch), Bens Creek, Chickenfoot Creek, and Ferguson Creek (Quarter Creek, Big Ferguson Creek, Little Ferguson Creek). There are several ponds and lakes (totaling 1,503.9 acres) and a total of 201.9 stream miles in this watershed, all classified FW.

Water Quality

Station #	Type	Class	Description
B-317	P	FW	MUSH CREEK AT SC 253, BELOW TIGERVILLE
B-741	BIO	FW	SOUTH TYGER RIVER AT UNNUMBERED ROAD, S OF S-23-569
CL-100	W	FW	LAKE ROBINSON IN FOREBAY NEAR DAM
B-341	W	FW	LAKE CUNNINGHAM IN FOREBAY NEAR DAM
B-149	S	FW	SOUTH TYGER RIVER AT SC 14, 2.9 MI NNW OF GREER
B-263	S	FW	SOUTH TYGER RIVER AT SC 290, 3.7 MI E OF GREER
B-625	BIO	FW	MAPLE CREEK AT SR 644
B-005A	BIO	FW	SOUTH TYGER RIVER AT S-42-242
B-005	S	FW	SOUTH TYGER RIVER AT S-42-63
B-782	BIO	FW	BENS CREEK AT SC 417
B-332	W	FW	SOUTH TYGER RIVER AT S-42-86, 5 MI NE OF WOODRUFF
B-787	BIO	FW	FERGUSON CREEK AT SR 86

South Tyger River - There are six monitoring sites along the South Tyger River. At the furthest upstream site ***(B-741)***, aquatic life uses are fully supported based on macroinvertebrate community data. At the next site downstream ***(B-149)***, aquatic life uses are fully supported; however, there are significant decreasing trends in dissolved oxygen concentrations and pH. Significant decreasing trends in five-day biochemical

oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported at this site. Aquatic life uses are fully supported further downstream ***(B-263)***; however, there is a significant decreasing trend in pH and significant increasing trends in total phosphorus concentration and turbidity. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Continuing downstream ***(B-005A),*** aquatic life uses are partially supported based on macroinvertebrate community data. At the next site downstream ***(B-005),*** aquatic life uses are fully supported, although there is a significant decreasing trend in pH and significant increasing trends in total phosphorus concentration and turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the furthest downstream site ***(B-332),*** although there were some zinc excursions and one high concentration in 1995, aquatic life uses are fully supported based on macroinvertebrate community data. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Mush Creek (B-317) - Aquatic life uses are fully supported. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Lake John Robinson (CL-100) - Lake Robinson is an 802-acre impoundment on the South Tyger River in Greenville County, with a maximum depth of approximately 40 feet (12.3 m) and an average depth of approximately 18 feet (5.4 m). Lake Robinson's watershed comprises 47 square miles (123 km2). Aquatic life uses are partially supported due to pH excursions. Recreational uses are fully supported.

Lake Cunningham (B-341) - Lake Cunningham is a 250-acre impoundment on the South Tyger River in Greenville County, with a maximum depth of approximately 19 feet (5.8 m) and an average depth of 8.9 feet (2.7 m). Lake Cunningham's watershed comprises approximately 48 square miles (124 km2), and includes Lake John Robinson. Aquatic life and recreational uses are fully supported.

Maple Creek *(B-625)* - Aquatic life uses are fully supported based on macroinvertebrate community data.

Bens Creek *(B-782)* - Aquatic life uses are fully supported based on macroinvertebrate community data.

Ferguson Creek *(B-787)* - Aquatic life uses are fully supported based on macroinvertebrate community data.

Natural Swimming Areas

FACILITY NAME / *RECEIVING STREAM*	*PERMIT #* / *STATUS*
LOOK UP LODGE BURBAN FORK CREEK	23-N14 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / *FACILITY NAME* / *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* / *TYPE* / *LIMITATION*
SOUTH TYGER RIVER SSSD/S. TYGER REGIONAL WWTP PIPE #:001 FLOW: 1.0-2.0 WQL FOR TRC	SC0047732 MAJOR DOMESTIC WATER QUALITY
SOUTH TYGER RIVER LAKEVIEW STEAK HOUSE PIPE #: 001 FLOW: 0.0158	SC0030465 MINOR DOMESTIC EFFLUENT
SOUTH TYGER RIVER MEMC ELECTRONIC MATERIALS PIPE #: 001 FLOW: 0.9 WQL FOR TRC; NOT OPERATING	SC0036145 MAJOR INDUSTRIAL WATER QUALITY
SOUTH TYGER RIVER CITY OF GREER CPW WTP PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R WQL FOR TRC	SCG645020 MINOR DOMESTIC WATER QUALITY WATER QUALITY
SOUTH TYGER RIVER SSSD/RIVER FALLS PLANTATION PIPE #: 001 FLOW: 0.07 NOT OPERATING	SC0043524 MINOR DOMESTIC EFFLUENT
SOUTH TYGER RIVER CITY OF GREER/MAPLE CREEK PLT PIPE #: 001 FLOW: 3.0 (PHASE I) PIPE #: 001 FLOW: 4.5 (PHASE II) WQL FOR DO,TRC,NH3N	SC0046345 MAJOR DOMESTIC WATER QUALITY WATER QUALITY
WARDS CREEK KOCH MATERIALS CO. PIPE #: 001, 002 FLOW: M/R	SC0048003 MINOR INDUSTRIAL EFFLUENT
BEAVERDAM CREEK HANSON AGGREGATES/SANDY FLATS PIPE #: 001 FLOW: M/R	SCG730079 MINOR INDUSTRIAL EFFLUENT
BURBAN FORK CREEK LOOK UP LODGE/PM UTILITIES INC. PIPE #: 001 FLOW: 0.03 WQL FOR TRC,NH3N	SC0026379 MINOR DOMESTIC WATER QUALITY

MEADOW FORK UNITED UTIL./NORTH GREENVILLE COLLEGE PIPE #: 001 FLOW: 0.04 WQL FOR TRC,NH3N	SC0026565 MINOR DOMESTIC WATER QUALITY
WILLIAMS CREEK CARMET COMPANY PIPE #: 001 FLOW: 0.009 PIPE #: 002 FLOW: 0.057 WQL FOR DO,TRC,NH3N	SC0038083 MINOR INDUSTRIAL WATER QUALITY WATER QUALITY
WILLIAMS CREEK MILLIKEN/ARMITAGE PLT PIPE #: 001 FLOW: 0.36 WQL FOR TRC,NH3N	SC0023451 MINOR INDUSTRIAL WATER QUALITY
WILLIAMS CREEK TRIBUTARY US ALUMOWELD CO., INC. PIPE #: 001 FLOW: 0.003 WQL FOR NH3N,TRC	SC0043982 MINOR INDUSTRIAL WATER QUALITY

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
LOOK UP LODGE/RESIDENT BURBAN FORK CREEK	23-305-0116 ACTIVE

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
BLUE RIDGE LANDFILL DOMESTIC	DWP-071 (SCD987581329) CLOSED
BLUE RIDGE LANDFILL DOMESTIC	DWP-082 (SCD987581329) CLOSED
GODFREY LANDFILL INDUSTRIAL	IWP-225 CLOSED
GLENN SHORT TERM C&D LANDFILL C&D	232903-1301 ———
WING QUARRY C&D LANDFILL C&D	232644-1201 ———
BROOKWOOD DRIVE LANDFILL ———	232900-1301 ———
RHEM GRADING ———	422900-1302 ———

CITY OF GREER	231003-6001
DOMESTIC	-------

Land Application Sites

LAND APPLICATION SYSTEM FACILITY NAME	*ND# TYPE*
SPRAYFIELD	ND0067351
RD ANDERSON APPLIED TECH. CTR.	DOMESTIC

Mining Activities

MINING COMPANY MINE NAME	*PERMIT # MINERAL*
DAVIDSON MINERAL PROPERTIES, INC.	0502-45
SANDY FLAT QUARRY	GRANITE
WR GRACE & CO.	1140-45
TIGER MINE	VERMICULITE

Water Supply

WATER USER STREAM	*TOTAL PUMP. CAPACITY (MGD) RATED PUMP. CAPACITY (MGD)*
CITY OF GREER CPW	23.0
LAKE CUNNINGHAM	18.0

Growth Potential

There is a high potential for industrial, commercial, and residential growth in this watershed, which contains the City of Greer, and portions of the Town of Duncan and the City of Woodruff. The Greenville-Spartanburg Airport expansion, the development of the BMW automotive plant, and highway improvements in the area surrounding the BMW plant will stimulate continued growth. Growth is also expected around the I-85 and U.S. Hwy. 29 corridors, which connect the Cities of Greenville, Greer, and Spartanburg. The Town of Duncan is expected to serve as a bedroom community for the Greer-Spartanburg area.

03050107-020

(North Tyger River)

General Description

Watershed 03050107-020 is located in Spartanburg County and consists primarily of the upper ***North Tyger River*** and its tributaries. The watershed occupies 22,375 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Cataula series. The erodibility of the soil (K) averages 0.27, and the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 53.0% forested land, 27.3% agricultural land, 15.4% urban land, 2.0% water, 1.6% scrub/shrub land, and 0.7% barren land.

Jordan Creek, which was impounded to create Lake Cooley, drains into the North Tyger River along with several unnamed tributaries. There are several ponds and lakes (totaling 214.3 acres) in this watershed used for recreational purposes and 31.9 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-348	W	FW	LAKE COOLEY IN FOREBAY NEAR DAM
B-315	S	FW	TRIBUTARY TO N. TYGER RIVER AT ROAD BELOW JACKSON #2 EFFLUENT
B-219	S	FW	NORTH TYGER RIVER AT US 29, 7.2 MI W OF SPARTANBURG

North Tyger River (B-219) - Aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standards; both high concentrations of zinc were measured in 1995. There are also significant decreasing trends in dissolved oxygen concentration and pH and a significant increasing trend in turbidity. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Cooley (B-348) - Lake Cooley is a 330-acre impoundment on Jordan Creek in Spartanburg County, with a maximum depth of approximately 39 feet (12.0 m) and a mean depth of 4.0 feet (1.2 m). Lake Cooley's watershed comprises approximately 10 square miles (27 km2). Aquatic life uses are partially supported due to pH excursions. Recreational uses are fully supported.

Unnamed Tributary to the North Tyger River (B-315) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / FACILITY NAME / PERMITTED FLOW @ PIPE (MGD)	*NPDES# / TYPE / LIMITATION*
NORTH TYGER RIVER SSSD/BUCKEYE FOREST WWTP PIPE #: 001 FLOW: 0.06	SC0000957 MINOR DOMESTIC EFFLUENT
NORTH TYGER RIVER AMERITEX YARN/SPARTANBURG PLT PIPE #: 001 FLOW: M/R	SCG250147 MINOR INDUSTRIAL EFFLUENT
NORTH TYGER RIVER LEIGH FIBERS, INC. PIPE #: 001 FLOW: M/R	SCG250170 MINOR INDUSTRIAL EFFLUENT
LAKE COOLEY VULCAN MATERIALS CO./LYMAN QUARRY PIPE #: 001 FLOW: M/R	SCG730056 MINOR INDUSTRIAL EFFLUENT
NORTH TYGER TRIBUTARY JACKSON MILLS/WELLFORD PLT PIPE #: 001 FLOW: 0.05 WQL FOR DO,TRC,NH3N	SC0001716 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME / FACILITY TYPE	*PERMIT # / STATUS*
WELLFORD LANDFILL DOMESTIC	DWP-078 (421001-1101) ACTIVE
OLD WELLFORD LANDFILL DOMESTIC	DWP-012 CLOSED
SPARTANBURG COUNTY C&D LANDFILL C&D LANDFILL	421001-1201 ———
SPARTANBURG COUNTY LANDFILL DOMESTIC	421001-1202 ———
MESSER MIRROR LANDFILL INDUSTRIAL	IWP-196 ———

Mining Activities

MINING COMPANY / MINE NAME	*PERMIT # / MINERAL*
VULCAN MATERIAL CO. LYMAN QUARRY	0587-83 GRANITE

Growth Potential

There is a high potential for industrial, commercial, and residential growth in this watershed, which contains the Town of Duncan. The I-85 corridor runs through the watershed connecting the Cities of Greer and Spartanburg. There are also industrial developmental pressures along U.S. Hwy. 29. The Town of Duncan is expected to serve as a bedroom community for the Greer-Spartanburg area.

03050107-030

(North Tyger River)

General Description

Watershed 03050107-030 is located in Spartanburg County and consists primarily of the lower ***North Tyger River*** and its tributaries. The watershed occupies 33,796 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Davidson-Pacolet-Enon-Cecil series. The erodibility of the soil (K) averages 0.29, and the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 60.4% forested land, 19.5% urban land, 14.9% agricultural land, 4.9% scrub/shrub land, 0.1% barren land, and 0.2% water.

Frey Creek (Grays Creek) drains into the North Tyger River followed by Jimmies Creek, Cub Branch, Ranson Creek, Tim Creek (Montgomery Pond), and Stillhouse Branch. Further downstream the river flows through Ott Shoals and accepts drainage from Wards Creek (Tanyard Branch), Tin Roof Branch, Johnson Branch (Big Branch), and Thomas Branch. There are several ponds and lakes (totaling 34.3 acres) in this watershed used for recreational purposes and 70.3 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-017	BIO	FW	NORTH TYGER RIVER AT SC 296
B-018A	S	FW	NORTH TYGER RIVER AT S-42-231, 11 MI S OF SPARTANBURG

North Tyger River - There are two monitoring sites along this section of the North Tyger River. At the upstream site ***(B-017)***, aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(B-018A)***, aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration and a significant increasing trend in total phosphorus concentration. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
NORTH TYGER RIVER SSSD/NORTH TYGER RIVER PIPE #: 001 FLOW: 1.0 (PHASE I) PIPE #: 001 FLOW: 2.0 (PHASE II) WQL FOR BOD5,DO,TRC,NH3N TO BE ELIMINATED (TIED INTO SSSD/LOWER N. TYGER R. WWTP)	SC0043532 MAJOR DOMESTIC WATER QUALITY WATER QUALITY
NORTH TYGER RIVER SSSD/LOWER N. TYGER RIVER WWTP PIPE #: 001 FLOW: 0.5 PIPE #: 001 FLOW: 2.5 (PHASE II) WQL FOR TRC	SC0048143 MINOR DOMESTIC WATER QUALITY WATER QUALITY

NORTH TYGER RIVER TRIBUTARY ABCO INDUSTRIES LTD. PIPE #: 001 FLOW: 0.036	SC0002321 MAJOR INDUSTRIAL EFFLUENT
TIM CREEK SSSD/ROEBUCK MIDDLE SCHOOL PIPE #: 001 FLOW: 0.022 WQL FOR DO,TRC,NH3N	SC0037532 MINOR DOMESTIC WATER QUALITY
TIM CREEK SSSD/TIM CREEK WWTP PIPE #: 001 FLOW: 0.03 WQL FOR TRC,NH3N TO BE ELIMINATED (TIED INTO SSSD/LOWER N. TYGER R. WWTP)	SC0041491 MINOR DOMESTIC WATER QUALITY
JIMMIES CREEK SYBRON CHEMICALS INC. PIPE #: 001 FLOW: 0.36 WQL FOR DO	SCG250194 MINOR INDUSTRIAL WATER QUALITY
RANSON CREEK MADERA SD PIPE #: 001 FLOW: 0.076 WQL FOR DO,TRC,NH3N	SC0021687 MINOR DOMESTIC WATER QUALITY
RANSON CREEK TRIBUTARY LINVILLE HILLS SD/PALMETTO UTIL. PIPE #: 001 FLOW: 0.12 WQL FOR DO,TRC,NH3N	SC0034169 MINOR DOMESTIC WATER QUALITY
FREY CREEK MIDWAY PARK WWTP PIPE #: 001 FLOW: 0.015 WQL FOR TRC	SC0030571 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
PALMETTO LANDFILL DOMESTIC	422401-1101 ACTIVE
PALMETTO LANDFILL DOMESTIC	DWP-092 ACTIVE
TINDAL CONCRETE SPECIAL WASTE LANDFILL INDUSTRIAL	423340-1601 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
KING ASPHALT ANDERSON MINE	1213-83 RIVER SAND

Growth Potential

There is a high potential for growth in this watershed, which contains portions of the Town of Duncan and the City of Spartanburg. I-26 and I-85 bisect the watershed and growth is expected around the major highway interchanges, along with industrial developmental pressures along U.S. Hwy. 29 and U.S. Hwy. 221. The Cities of Greer and Spartanburg are connected via the I-85 corridor, and the Town of Duncan is expected to serve as a bedroom community for the Greer-Spartanburg area. The City of Spartanburg is building regional treatment facilities, which should provide for future growth.

03050107-040

(Middle Tyger River)

General Description

Watershed 03050107-040 is located in Greenville and Spartanburg Counties and consists primarily of the ***Middle Tyger River*** and its tributaries. The watershed occupies 54,597 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 63.2% forested land, 22.0% agricultural land, 11.0% urban land, 1.9% scrub/shrub land, 1.1% water, and 0.8% barren land.

The Middle Tyger River accepts drainage from Campbell Creek, Beaverdam Creek (Barnes Creek), and Spencer Creek before flowing into Lyman Lake (Meadow Creek). Downstream of Lyman Lake, another Beaverdam Creek (Foyster Creek, Thompson Branch, Berrys Millpond, Silver Lake) flows into the river followed by Twin Lakes much further downstream. There are numerous ponds and lakes (totaling 578.7 acres) and a total of 97.2 stream miles in this watershed, all classified FW.

Water Quality

Station #	Type	Class	Description
B-794	BIO	FW	MIDDLE TYGER RIVER AT RED TURNER RD, 0.5 MI E. OF SC 101
B-148	P/BIO	FW	MIDDLE TYGER RIVER AT SC 14, 2 MI SSW GOWANSVILLE
B-784	BIO	FW	BEAVERDAM CREEK AT SC 357
B-012	S	FW	MIDDLE TYGER RIVER AT S-42-63
B-014	W/BIO	FW	MIDDLE TYGER RIVER AT S-42-64

Middle Tyger River – There are four monitoring sites along this section of the North Tyger River. At the furthest upstream site ***(B-794)***, aquatic life uses are fully supported based on macroinvertebrate community data. Aquatic life uses are fully supported at the next site downstream ***(B-148)*** based on macroinvertebrate community data and physical/chemical data; however, there is a significant increasing trend in turbidity. A significant increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions for these parameters. A very high concentration of zinc was measured in water in 1995 and a very high concentration of cadmium was measured in the 1995 sediment sample. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. A total maximum daily load (TMDL) has been developed to address this impairment (see Watershed Protection and Restoration Strategies below).

Further downstream ***(B-012)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the furthest downstream site ***(B-014)***, aquatic life uses are fully supported based on macroinvertebrate

community data and physical/chemical data. A high concentration of copper was measured in water in 1995. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Beaverdam Creek (B-784) - Aquatic life uses are partially supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
MIDDLE TYGER RIVER SPARTAN MILLS/STARTEX MILL PIPE #: 002 FLOW: 0.4 WQL FOR BOD5,DO,TRC	SC0002453 MINOR INDUSTRIAL WATER QUALITY
MIDDLE TYGER RIVER TOWN OF LYMAN WWTP PIPE #: 001 FLOW: 4.5 PIPE #: 001 FLOW: 5.0 (PHASE II) PIPE #: 001 FLOW: 6.0 (PHASE III) WQL FOR BOD5,DO,TRC,NH3N	SC0021300 MAJOR DOMESTIC WATER QUALITY WATER QUALITY WATER QUALITY
MIDDLE TYGER RIVER SJWD/WTP PIPE #: 001 FLOW: M/R	SCG643003 MINOR DOMESTIC EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
WR GRACE - CRYOVAC DIV. INDUSTRIAL	422900-1301 (SCD003341609) ---

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
TILEFIELD BLUE RIDGE HIGH SCHOOL	ND0064629 DOMESTIC

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CLARK CONSTRUCTION CO. CLARK-TYGER SAND MINE	0886-45 SAND

AUGUSTA SAND & GRAVEL INC.-GREER PLT. RESTER MINE	0880-45 SAND & GRAVEL

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
SJWD	24.0
MIDDLE TYGER RIVER	10.0

Growth Potential

There is a high potential for growth in this watershed, which contains a portion of the Town of Duncan. The Cities of Greer and Spartanburg are connected via the I-85 corridor, which bisects this watershed. There are also industrial developmental pressures along U.S. Hwy. 29.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A total maximum daily load (TMDL) for fecal coliform has been developed for the Middle Tyger River. Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Between 1991 and 1995, 38% of the samples collected at station BE-148 exceeded the 400 colonies/100ml standard. Targeting agricultural land for reduction of bacteria is the most effective strategy for this watershed.

A target level for fecal coliform bacteria of 175 colonies/100mlwas established. This translates to an agricultural bacteria-loading reduction of 68%. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use.

There are several tools available for implementing this TMDL, such as Nonpoint Source (NPS) pollution outreach activities and materials. SCDHEC will continue to monitor water quality in the Middle Tyger River to evaluate the effectiveness of these measures.

Funding for TMDL implementation activities is currently available. For more information, see the Bureau of Water web page www.scdhec.net/water or call the Watershed Program at (803) 898-4300.

03050107-050

(Tyger River)

General Description

Watershed 03050107-050 is located in Spartanburg and Union Counties and consists primarily of the ***Tyger River*** and its tributaries from its confluence with the South and North Tyger Rivers to its confluence with the Broad River. The watershed occupies 138,402 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Madison series. The erodibility of the soil (K) averages 0.24, and the slope of the terrain averages 20%, with a range of 6-45%. Land use/land cover in the watershed includes: 81.8% forested land, 10.9% scrub/shrub land, 6.2% agricultural land, 0.7% urban land, 0.3% barren land, and 0.1% water.

The Tyger River is formed by the confluence of the South Tyger River Watershed and the North Tyger River Watershed. The Tyger River then accepts drainage from Nichol Branch (Kelly Branch), Vise Branch, Harrelson Branch (Wofford Branch, Aiken Branch), Jimmies Creek, Cane Creek (Martha Shands Branch, Williams Branch, Trail Branch), Motley Branch, Hackers Creek, and Dutchman Creek. Dutchman Creek accepts drainage from Harrison Branch, Newman Branch, Smith Creek (Jennings Branch), Powder Spring Branch, Shands Branch (Pennywinkle Branch), Paint Bearden Branch, Bearden Branch, another Wofford Branch, Wiley Fork Creek (Carson Branch), and Dry Branch. Cowdens Creek enters the river next followed by Mill Creek, another Wofford Branch, Holcombe Branch, Isaacs Creek, and Sparks Creek. Further downstream, the Tyger River accepts drainage from the Fairforest Creek Watershed, the Tinker Creek Watershed, Hawkins Creek, Johnsons Creek, Padgetts Creek, Evans Branch, Rennicks Branch, Duffs Branch, Peters Creek, and Cane Creek (Brocks Creek). There are a few ponds and lakes (totaling 133.7 acres) in this watershed used for recreational purposes and 274.8 stream miles, all classified FW. The lower half of the watershed resides within the Sumter National Forest. Rose Hill State Park is located near the confluence of the Tyger River and Fairforest Creek.

Water Quality

Station #	Type	Class	Description
B-008	P	FW	TYGER RIVER AT S-42-50, E OF WOODRUFF
B-019	S	FW	JIMMIES CREEK AT S-42-201, 2 MI E OF WOODRUFF
B-786	BIO	FW	JIMMIES CREEK AT STEWART RD, 1MI UPSTREAM OF SR 113
B-733	BIO	FW	DUTCHMAN CREEK AT S-42-511
B-051	P	FW	TYGER RIVER AT SC 72, 5.5 MI SW OF CARLISLE
B-777	BIO	FW	CANE CREEK AT SR 359

Tyger River - There are two monitoring sites along the Tyger River. At the upstream site ***(B-008),*** aquatic life uses are fully supported; however, there are significant decreasing trends in dissolved oxygen concentration and pH, and a significant increasing trend in turbidity. A very high concentration of chromium was measured in water in 1998. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen suggest improving conditions for these parameters. At the downstream site ***(B-051),*** aquatic life uses are fully supported. There is a significant decreasing trend in pH and a significant

increasing trend in total phosphorus concentrations. In water, a high concentration of zinc and very high concentrations of lead and chromium were each measured once in 1996. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen suggest improving conditions for these parameters. Recreational uses are not supported at either site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter at the downstream site.

Jimmies Creek (B-019) - There are two monitoring sites along Jimmies Creek. At the upstream site ***(B-019)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH and a significant increasing trend in total phosphorus concentrations. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the downstream site ***(B-786)***, aquatic life uses are fully supported based on macroinvertebrate community data.

Dutchman Creek (B-733) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Cane Creek (B-777) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
TYGER RIVER SC DEPT. CORR./CROSS ANCHOR CORR. INST. PIPE #: 001 FLOW: 0.35	SC0036773 MINOR DOMESTIC EFFLUENT
TYGER RIVER TRIBUTARY WR GRACE & CO./CL CASEY MINE PIPE #: 001 FLOW: M/R	SCG730096 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
WOODRUFF INERT & CELLULOSIC LANDFILL DOMESTIC	DWP-916 CLOSED
LANDFORD ROAD LAND CLEARING CONSTRUCTION	421002-1201 (CWP-013) ———

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WR GRACE & CO. PROVIDENCE MINE	0706-83 VERMICULITE
WR GRACE & CO. C. CASEY MINE	1017-83 VERMICULITE ORE
WR GRACE & CO. RODGERS MINE	0460-83 VERMICULITE
CHAPMAN GRADING & CONCRETE TYGER RIVER PLANT	0494-83 SAND
KING ASPHALT, INC. JOSEPH W. THEO MINE	1124-83 SAND
CAROLINA VERMICULITE CO. FANNIE YOUNG MINE	0585-83 VERMICULITE

Growth Potential

There is an overall low potential for growth in this watershed, which contains portions of the Town of Carlisle and the City of Woodruff. Woodruff is expected to experience residential, commercial, and industrial growth. The lower portion of the watershed is effectively excluded from development by the Sumter National Forest. Union County is actively pursuing the development of a multi-county landfill.

03050107-060

(Fairforest Creek/Tinker Creek)

General Description

Watershed 03050107-060 is located in Spartanburg and Union Counties and consists primarily of ***Fairforest Creek and Tinker Creek*** and their tributaries. Both Fairforest Creek and Tinker Creek flow into the Broad River. The watershed occupies 157,870 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison-Wilkes series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 13% with a range of 2-40%. Land use/land cover in the watershed includes: 64.4% forested land, 14.7% urban land, 10.5% agricultural land, 9.6% scrub/shrub land, 0.4% barren land, and 0.4% water.

Fairforest Creek originates near the City of Spartanburg and accepts drainage from Goat Pond Creek, Holston Creek, Beaverdam Creek (Reedy Creek), Foster Creek (Underwood Branch), Reedy Branch, Buffalo Creek (Zimmerman Pond), Fleming Branch, Goose Branch, Stillhouse Branch (Smith Branch), and Lancaster Branch (James Branch, Pauline Creek, Dugan Creek). Kelsey Creek flows through Lake Craig (Lake Johnson, Thompson Creek) before entering Fairforest Creek. Black Branch (Whitestone Spring Branch) flows into Fairforest Creek next followed by McElwain Creek (Story Branch, Mineral Spring Branch, Sulphur Spring Branch), Kennedy Creek (Iscons Creek, Cunningham Creek), McClure Creek, Sugar Creek (another Beaverdam Creek, Whitlock Lakes, White Pine Lake), Swink Creek (Bishop Branch), and Rocky Creek. Swink Creek is also known as Mitchell Creek and Bishop Branch is also known as Mill Creek. Further downstream, Fairforest Creek accepts drainage from Mitchell Creek, another Sugar Creek (West Springs Branch), another Buffalo Creek, Dining Creek, Shoal Creek (Toschs Creek), Sand Creek, and Morris Branch.

Tinker Creek flows into the Broad River downstream of Fairforest Creek. Tinker Creek accepts drainage from Henry Creek (Reno Lake), Brushy Creek, and Swift Run. There are several ponds and lakes (totaling 424.3 acres) in this watershed used for recreational purposes, and 261.8 stream miles, all classified FW. The lower portion of the watershed resides within the Sumter National Forest, and Croft State Park is located next to Fairforest Creek, just south of the City of Spartanburg.

Water Quality

Station #	Type	Class	Description
B-321	P	FW	TRIBUTARY TO FAIRFOREST CREEK, 200 FEET BELOW S-42-65
B-020	S	FW	FAIRFOREST CREEK AT US 221, S OF SPARTANBURG
B-164	S	FW	FAIRFOREST CREEK AT S-42-651, 3.5 MI SSE OF SPARTANBURG
B-021	P/BIO	FW	FAIRFOREST CREEK AT SC 56
B-235	S	FW	KELSEY CREEK AT S-42-321
CL-035	W	FW	LAKE JOHNSON AT SPILLWAY AT S-42-359
CL-033	W	FW	LAKE CRAIG 45 METERS NW OF DAM
BF-007	S	FW	FAIRFOREST CREEK ON COUNTY ROAD 12, SW OF JONESVILLE
B-199	S	FW	MITCHELL CREEK AT COUNTY ROAD 233, 2.3 MI SSW OF JONESVILLE
B-781	BIO	FW	MITCHELL CREEK AT SR 19, 1ST REPLICATE OF 2 STA., DOWNSTREAM OF BRIDGE
B-779	BIO	FW	SUGAR CREEK AT SR 52

B-067A	S	FW	TOSCHS CREEK AT US 176, 2 MI SW OF UNION
B-067B	S	FW	TOSCHS CREEK AT ROAD TO TREATMENT PLANT OFF S-44-92, SW OF UNION
BF-008	S/BIO	FW	FAIRFOREST CREEK AT S-44-16, SW OF UNION
B-286	S	FW	TINKER CREEK AT ROAD TO TREATMENT PLANT, 1.3 MI SSE OF UNION
B-287	S	FW	TINKER CREEK AT UNNUMBERED COUNTY ROAD, 1.7 MI SSE OF UNION
B-336	W/BIO	FW	TINKER CREEK AT S-44-278, 9 MI SSE OF UNION

Fairforest Creek - There are five monitoring sites along Fairforest Creek. At the furthest upstream site ***(B-020)***, aquatic life uses are fully supported. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. There are no metals data available for this site. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the next site downstream ***(B-164)***, aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There are no metals data available for this site. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Further downstream ***(B-021)***, aquatic life uses are not supported due to impacts to the macroinvertebrate community, and occurrences of chromium, copper, and zinc in excess of the aquatic life acute standards. There were three very high concentrations of chromium measured from 1995 through 1998 and two high concentrations of zinc. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

At the next site downstream ***(BF-007)***, aquatic life uses are fully supported. There are no metals data available for this site. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the furthest downstream site ***(BF-008)***, aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data; however, there is a significant decreasing trend in pH and a significant increasing trend in total phosphorus concentrations. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Unnamed Tributary to Fairforest Creek (B-321) - Aquatic life uses are not supported due to occurrences of chromium, copper, and zinc in excess of the aquatic life acute standards, including four very high concentrations of chromium measured from 1995 through 1999, five high concentrations of zinc measured from 1995 through 1998, and one very high concentration of zinc measured in 1999. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentrations.

Kelsey Creek (B-235) - Aquatic life uses are fully supported, although there are significant decreasing trends in dissolved oxygen concentration and pH. A significant decreasing trend in five-day biochemical

oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Johnson (CL-035) - Lake Edwin Johnson, in Croft State Park in Spartanburg County, is a 40-acre impoundment on Thompson Creek. Lake Johnson's maximum depth is approximately 28 feet (8.5 m); average depth is approximately 14 feet (4.4 m). The lake's watershed comprises approximately 9.3 square miles (24 km2) and includes Lake Craig. The lake is managed for fishing and supports high algal biomass. Aquatic life uses are partially supported due to pH excursions. Recreational uses are fully supported.

Lake Craig (CL-033) - Lake Tom Moore Craig, in Croft State Park in Spartanburg County, is a 105-acre impoundment on Kelsey Creek. The average depth of Lake Craig is approximately 17 feet (5.2 m); the maximum depth is approximately 20 feet (6.1 m). The lake's watershed comprises approximately 8.1 square miles (21 km2). The impoundment has been reconstructed after being destroyed in 1990 floods. Aquatic life uses are fully supported. Although two pH excursions occurred, one was a high value and one was a low value, and therefore do not represent consistent, chronic problems. Recreational uses are fully supported.

Swink Creek or Mitchell Creek (B-199) - There are two monitoring sites along Mitchell Creek. At the upstream site ***(B-199)*** aquatic life uses are fully supported. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the downstream site ***(B-781),*** aquatic life uses are fully supported based on macroinvertebrate community data.

Sugar Creek (B-779)- Aquatic life uses are fully supported based on macroinvertebrate community data.

Toschs Creek - There are two monitoring sites along Toschs Creek. At the upstream site ***(B-067A),*** aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and turbidity suggest improving conditions for these parameters. At the downstream site ***(B-067B),*** aquatic life uses are also fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at either site due to fecal coliform bacteria excursions.

Tinker Creek - There are three monitoring sites along Tinker Creek. At the upstream site ***(B-286),*** aquatic life uses are fully supported; however, there is a significant decreasing trend in pH and a significant increasing trend in total phosphorus concentrations. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in

fecal coliform bacteria concentrations suggests improving conditions for this parameter.

Further downstream *(B-287)*, aquatic life uses are also fully supported and a significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. Although there were two copper excursions, aquatic life uses are fully supported at the furthest downstream site *(B-336)* based on macroinvertebrate community data. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENTS*	*NPDES#* *TYPE* *LIMITATION*
FAIRFOREST CREEK SSSD/FAIRFOREST PLANT PIPE #: 001 (Conversion to Regional WWTF) PHASE II: Upgrade SSSD/Fairforest to 20mgd; Construct new outfall to Pacolet River PHASE III: Eliminate SSSD/Lawson Fork & Upgrade SSSD/Fairforest to 30mgd	SC0020435 MAJOR DOMESTIC WQL FOR TRC, NH3N
FAIRFOREST CREEK FAIRWOODS SD/UNITED UTILITIES PIPE #: 001 FLOW: 0.065	SC0035041 MINOR DOMESTIC EFFLUENT
FAIRFOREST CREEK SSSD/CAROLINA COUNTRY CLUB PIPE #: 001 FLOW: 0.1 WQL FOR DO,TRC	SC0039560 MINOR DOMESTIC WATER QUALITY
FAIRFOREST CREEK CITY OF UNION/TOSCHS CREEK WWTP PIPE #: 001 FLOW: 6.0 WQL FOR BOD5,DO,TRC,NH3N	SC0047244 MAJOR DOMESTIC WATER QUALITY
FAIRFOREST CREEK WILSON BROS. SAND CO. PIPE #: 001 FLOW: M/R	SCG730202 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK DITCH ADO CORP. PIPE #: 001 FLOW: M/R	SCG250071 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK TRIBUTARY POWDERCRAFT CORP. PIPE #: 001 FLOW: M/R	SCG250159 MINOR INDUSTRIAL EFFLUENT
HOLSTON CREEK EVANS MHP PIPE #: 001 FLOW: 0.0038 WQL FOR TRC,NH3N	SC0029521 MINOR DOMESTIC WATER QUALITY

HOLSTON CREEK MINI MART/SPARTANBURG PIPE #: 001 FLOW: M/R	SCG830017 MINOR INDUSTRIAL EFFLUENT
REEDY CREEK SSSD/MARILYNDALE SD PIPE #: 001 FLOW: 0.0415 WQL FOR TRC	SC0030121 MINOR DOMESTIC WATER QUALITY
GOAT POND CREEK PHILLIPS PETROLEUM CO. PIPE #: 001 FLOW: 0.064 WQL FOR BOD	SC0047805 MINOR INDUSTRIAL WATER QUALITY
KELSEY CREEK CITCO PETROLEUM PIPE #: 001 FLOW: M/R	SCG340008 MINOR INDUSTRIAL EFFLUENT
KELSEY CREEK TRANSMONTAIGNE TER./SPARTANBURG PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R	SC0048089 MINOR INDUSTRIAL EFFLUENT EFFLUENT
KELSEY CREEK COLONIAL PIPELINE/SPARTANBURG PIPE #: 001 FLOW: M/R	SC0040665 MINOR INDUSTRIAL EFFLUENT
MILL CREEK TOWN OF JONESVILLE PIPE #: 001 FLOW: 0.25 WQL FOR DO,TRC,NH3N	SC0024988 MINOR DOMESTIC WATER QUALITY
MINERAL SPRING BRANCH SPARTANBURG BOYS HOME, INC. PIPE #: 001 FLOW: 0.0035 WQL FOR TRC	SC0024449 MINOR DOMESTIC WATER QUALITY
ROCKY CREEK MILLIKEN & CO./CEDAR HILL PLT PIPE #: 001 FLOW: 0.017 (PHASE I) PIPE #: 001 FLOW: 0.0187 (PHASE II) PIPE #: 001 FLOW: 0.0206 (PHASE III) WQL FOR TRC,NH3N	SC0000809 MINOR INDUSTRIAL WATER QUALITY WATER QUALITY WATER QUALITY
TOSCHS CREEK TRIBUTARY TORRINGTON CO./UNION BEARINGS PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R WQL FOR BOD5	SC0038636 MINOR INDUSTRIAL WATER QUALITY WATER QUALITY
ISCONS CREEK TRIBUTARY MILLIKEN & CO./WHITESTONE PKG PIPE #: 001 FLOW: M/R	SC0023370 MINOR INDUSTRIAL EFFLUENT
SUGAR CREEK TRIBUTARY UNION AMOCO STATION PIPE #: 001 FLOW: M/R	SCG830023 MINOR INDUSTRIAL EFFLUENT

TINKER CREEK CITY OF UNION/BELTLINE PLANT PIPE #: 001 FLOW: 0.35	SC0021202 MINOR DOMESTIC WQL FOR BOD5,DO,TRC,NH3N

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
RED HILL LANDFILL INDUSTRIAL	422429-1601 ACTIVE
CAMP CROFT LANDFILL DOMESTIC	421001-1102 (DWP-099, DWP-002) CLOSED
CITY OF SPARTANBURG TRANSFER STATION DOMESTIC	421005-6001 ———
CITY OF UNION - BRISON ST C&D CONSTRUCTION	441003-1301 ———
PHILIPPI CHURCH RD ST LANDFILL CONSTRUCTION	442604-1301 ———
DISCOUNT TIRE OF SPARTANBURG ———	422450-5201 ———
MAXIE COPELAND LANDFILL LONGTERM C&D LANDFILL	442329-1201 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WILSON BROTHERS SAND CO. FAIRFOREST CREEK SAND MINE	1059-83 SAND

Growth Potential

There is a high potential for growth in this watershed, which contains portions of the Cities of Spartanburg and Union, the Towns of Pacolet and Jonesville, and the Buffalo Mill Village. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges at the top of the watershed. There are also industrial developmental pressures along I-26, U.S. Hwy. 29, and U.S. Hwy. 221. Urban development is evident in the City of Union and in the unincorporated Buffalo Mill Village in the form of residential, commercial, and industrial uses. Growth is most evident along the U.S. Hwy. 176 Bypass. U.S. Hwy. 176 north from Union to Spartanburg has been widened to four lanes and has generated the development of an industrial park. The lower portion of the watershed is effectively excluded from development by the Sumter National Forest.

Broad River Basin Description

The ***Broad River Basin*** encompasses 21 watersheds and 2,252 square miles within South Carolina, excluding the Enoree River and Tyger River Basins. The Broad River flows across the Piedmont region of the State. Of the approximately 1.4 million acres, 72.1% is forested land, 13.4% is agricultural land, 6.9% is urban land, 5.3% is scrub/shrub land, 1.8% is water, and 0.5% is barren land. The urban land percentage is comprised chiefly of the Cities of Spartanburg, Gaffney, and Chester, and portions of the Cities of York, Union, and Columbia. In the Broad River Basin, there are approximately 2,508 stream miles and 14,602.5 acres of lake waters. The Broad River flows across the North Carolina/South Carolina state line and accepts drainage from Buffalo Creek, Cherokee Creek, Kings Creek, Thicketty Creek, Bullock Creek, and the Pacolet River. The Broad River then accepts drainage from Turkey Creek, Browns Creek, the Sandy River, the Little River, Jackson Creek, Mill Creek, and Cedar Creek before converging with the Saluda River in Columbia.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region that defines the Broad River Basin is as follows:

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover data for South Carolina was derived from SCDNR 1990 SPOT multispectral satellite images using image mapping software to inventory the State's land classifications, which are as follows.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, as well as vegetated portions of urban areas.

Agricultural/Grass land is characterized by cropland, pasture, and orchards and may include some grass cover in urban, scrub/shrub and forest areas.

Scrub/Shrub land is adapted from the western Rangeland classification to represent the "fallow" condition of the land (currently unused, yet vegetated), and is most commonly found in the dry Sandhills region including areas of farmland, sparse pines, regenerating forest lands, and recently harvested timber lands.

Forest land is characterized by deciduous and evergreen trees not including forests in wetland settings.

Forested Wetland (swampland) is the saturated bottomland, mostly hardwood forests that are primarily composed of wooded swamps occupying river floodplains and isolated low-lying wet areas, primarily located in the Coastal Plain.

Nonforested Wetland (marshland) is dependent on soil moisture to distinguish it from scrub/shrub since both classes contain grasses and low herbaceous cover; nonforested wetlands are most common along the coast and isolated freshwater areas found in the Coastal Plain.

Barren land is characterized by an unvegetated condition of the land, both natural (rock, beaches and unvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest).

Water (non-land) includes both fresh and tidal waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Broad River Basin are described as follows.

Alpin soils are well drained and excessively drained, sandy soils with a loamy or sandy subsoil.

Badin soils are moderately deep, well drained, moderately permeable, clayey soils that formed in material weathered from Carolina Slate or other fine grained rock, on ridgetops and side slopes.
Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Georgeville soils are gently sloping to sloping, well drained and moderately well drained soils.

Goldston soils are dominantly sloping to steep, well drained to excessively drained soils.

Helena soils are gently sloping to sloping, moderately well drained to well drained soils.

Herndon soils are gently sloping to sloping, well drained and moderately well drained soils.

Hiwassee soils are well drained, moderately sloping soils with clayey subsoil, moderately deep.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Tatum soils are dominantly sloping to steep, well drained to excessively drained soils, with a loamy subsoil, moderately deep or shallow to weathered rock.

Wilkes soils are dominantly strongly sloping to steep, well drained soils.

Winnsboro soils are well drained, gently sloping to steep, moderately deep to deep clayey soils.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil

properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Broad River Basin is from 0.15 to 0.39.

Fish Consumption Advisory

At the time of publication, there are no fish consumption advisories in the Broad River Basin. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.net/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Broad River area is 48.25 inches, according to the S.C. historic climatological record. Data compiled from National Weather Service stations in Rainbow Lake, Gaston Shoals, Gaffney, Ninety Nine Islands, Spartanburg, Santuck, Chester, Blair, Winnsboro, Parr, Little Mountain, Columbia at U.S.C., and Columbia Metropolitan Airport were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the summer with 13.55 inches; 12.41, 10.37, and 12.50 inches of rain falling in the fall, winter, and spring, respectively. The average annual daily temperature is 62.1°F. Summer temperatures average 78.4°F and fall, winter, and spring temperatures are 63.0°F, 45.0°F, and 62.1°F, respectively.

Watershed Evaluations

03050105-050

(Broad River)

General Description

Watershed 03050105-050 is located in Cherokee and Spartanburg Counties and consists primarily of tributaries of the ***Broad River***. This watershed occupies 16,496 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 44.2% forested land, 34.6% agricultural land, 11.0% urban land, 9.1% scrub/shrub land, 0.8% barren land, and 0.3% water.

Before the Broad River flows across the South Carolina/North Carolina border it accepts drainage from several streams originating in South Carolina that flow into North Carolina including Arrowood Branch, Big Horse Creek (Little Horse Creek, Jolleys Lake), Suck Creek, and Ashworth Creek. There are several small ponds and lakes in this watershed (totaling 43.8 acres) used for recreational purposes and 18.6 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-296	BIO	FW	SUCK CREEK AT WALTER RD OFF SR 29 NEAR NC STATE LINE

Suck Creek (B-296) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***LIMITATION***
COMMENT	
LITTLE HORSE CREEK	SC0002429
SPARTAN MILLS/MONTGOMERY DIV.	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	WATER QUALITY
WQL FOR TRC	

Growth Potential

There is a low potential for growth in this watershed.

03050105-090

(Broad River)

General Description

Watershed 03050105-090 is located in Cherokee and York Counties and consists primarily of the ***Broad River*** and its tributaries from the North Carolina border to the Pacolet River. The watershed occupies 82,800 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Goldston-Badin series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 12%, with a range of 2-45%. Land use/land cover in the watershed includes: 67.8% forested land, 18.8% agricultural land, 5.0% scrub/shrub land, 4.5% urban land, 2.8% water, and 1.1% barren land.

After the river crosses the state line, it accepts drainage from Ross Creek (Sarratt Creek), Mikes Creek, the Bowens River (Wylies Creek), the Buffalo Creek Watershed, and the Cherokee Creek Watershed. Further downstream, Peoples Creek (Furnace Creek, Toms Branch) drains into the river near the City of Gaffney. Doolittle Creek enters the river next, near the Town of Blacksburg, followed by London Creek (Lake Cherokee, Little London Creek), Bear Creek, McKowns Creek, Dry Branch, the Kings Creek Watershed, and Quinton Branch. Mud Creek enters the river next, downstream of Mud Island, followed by Guyonmbore Creek, Mountain Branch, Abingdon Creek (Wolf Branch, Service Branch, Jenkins Branch), the Thicketty Creek Watershed, Beaverdam Creek (McDaniel Branch), the Bullock Creek Watershed, and Dry Creek (Nelson Creek).

There are numerous ponds and lakes (totaling 245.6 acres) in this watershed and 133.0 stream miles, all classified FW. A fifteen mile segment of the Broad River, extending from Ninety Nine Islands Dam to the river's confluence with the Pacolet River is designated as a South Carolina State Scenic River in recognition of it's outstanding natural resources.

Water Quality

Station #	Type	Class	Description
B-789	BIO	FW	ROSS CREEK AT SR 577
B-788	BIO	FW	BOWENS RIVER AT SR 83
B-042	P	FW	BROAD RIVER AT SC 18, 4 MI NE GAFFNEY
B-088	S	FW	CANOE CREEK AT S-11-245, ½ MI W OF BLACKSBURG
B-211	S	FW	PEOPLES CREEK AT UNIMPROVED ROAD, 2.3 MI E OF GAFFNEY
B-100	S	FW	FURNACE CREEK AT S-11-50, 6 MI E OF GAFFNEY
B-323	S	FW	DOOLITTLE CREEK AT S-11-100, 1.25 MI SE OF BLACKSBURG
B-343	W	FW	LAKE CHEROKEE IN FOREBAY NEAR DAM
B-330	S	FW	GUYONMOORE CREEK AT S-46-233
B-044	P	FW	BROAD RIVER AT SC 211, 12 MI SE OF GAFFNEY

Broad River – There are two monitoring sites along this section of the Broad River. Aquatic life uses are fully supported at both sites ***(B-042, B-044)***; however, there is a significant increasing trend in turbidity. Significant increasing trends in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration at both sites suggest improving conditions for

these parameters. At the upstream site (B-042), a very high concentration of chromium was measured in 1996. At the downstream site (B-044), a very high concentration of zinc was measured in 1995. In sediments, P,P'DDT, and P,P'DDE and P,P'DDD, both metabolites of DDT, were detected in the 1999 sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are not supported at either site due to fecal coliform bacteria excursions.

Ross Creek (B-789) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Bowens River (B-788) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Canoe Creek (B-088) - Aquatic life uses are partially supported due to dissolved oxygen excursions. There is a significant decreasing trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions.

Peoples Creek (B-211) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter.

Furnace Creek (B-100) - Aquatic life uses are fully supported. P,P'DDT was detected in the 1998 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter.

Doolittle Creek (B-323) - Aquatic life uses are fully supported; however, there are significant decreasing trends in dissolved oxygen concentration and pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Lake Cherokee (B-343) - Lake Cherokee is a 45-acre impoundment at the headwaters of London Creek in Cherokee County, with a maximum depth of approximately 32 feet (9.8 meters) and an average depth of 11 feet (3.4 meters). Lake Cherokee's watershed comprises approximately 0.2 square miles (0.4 km2). In an effort to provide access for boating and fishing, the lake was stocked with triploid grass carp in 1985, 1987 and 1991; and aquatic herbicides were applied in 1989, 1991, and 1995. More recent efforts to clear access for boating and fishing included stocking grass carp and applying aquatic herbicide in 2001. Aquatic life and recreational uses are fully supported.

Guyonmoore Creek (B-330)- Aquatic life uses are fully supported. In sediments, a very high concentration of chromium was measured in the 1999 sample and di-n-butylphthalate was detected in the 1996 sample. Recreational uses are partially supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER SC DISTRIBUTORS INC. PIPE #: 001 FLOW: 0.04	SC0002755 MINOR DOMESTIC EFFLUENT
BROAD RIVER MILLIKEN & CO./MAGNOLIA PLT PIPE #: 001 FLOW: 3.10 (PHASE I) PIPE #: 001 FLOW: 3.89 (PHASE II)	SC0003182 MAJOR INDUSTRIAL EFFLUENT EFFLUENT
BROAD RIVER CHAMPION PRODUCTS PIPE #: 001 FLOW: 2.0	SC0035947 MAJOR INDUSTRIAL EFFLUENT
BROAD RIVER CITY OF GAFFNEY/PEOPLES CREEK PLT PIPE #: 001 FLOW: 4.0 WQL FOR DO	SC0047091 MAJOR DOMESTIC WATER QUALITY
BROAD RIVER TOWN OF BLACKSBURG/CANOE CREEK PLT PIPE #: 001 FLOW: 0.68 (PROPOSED) WQL FOR DO,TRC,NH3N	SC0047457 MINOR DOMESTIC WATER QUALITY
PEOPLES CREEK COLONIAL PIPELINE PIPE #: 001 FLOW: M/R	SCG830024 MINOR INDUSTRIAL EFFLUENT
PEOPLES CREEK HAMRICK MILLS PIPE #: 001 FLOW: M/R	SCG250167 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CITY OF GAFFNEY LANDFILL DOMESTIC	DWP-918; DWP-908 CLOSED
CITY OF GAFFNEY C/C LANDFILL DOMESTIC	CWP-022 (111002-1201) ———

CHEROKEE COUNTY LANDFILL INDUSTRIAL	111001-6001 (SCD001411040) CLOSED
BLACKSBURG DUMP-METROMONT ———	——— CLOSED
CHEROKEE RECYCLING CENTER ———	111001-5101 ———
DUKE POWER BURIAL SITE INDUSTRIAL	IWP-142 ———

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD PEELER RUG COMPANY	ND0070980 INDUSTRIAL
SPRAYFIELD SCREEN PRINTERS	ND0069451 INDUSTRIAL

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
RANDOLPH BROAD RIVER PLANT BROAD RIVER PLANT	0042-21 SAND
THOMAS SAND CO. BLACKSBURG PLANT	0869-21 SAND
RAY BROWN ENTERPRIZES BROWN #3 SAND MINE	1070-21 SAND

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF GAFFNEY BPW BROAD RIVER	18.0 12.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Town of Blacksburg and the City of Gaffney. The City of Gaffney is planning for new subdivision growth by considering new regional treatment facilities near the Cherokee Creek-Broad River area. Major growth is expected along the I-85 corridor, particularly in the area north of Gaffney. The potential for industrial growth exists along S.C. Hwy. 329 east of Gaffney due to an existing industrial park. Duke Power is planning to build a natural gas-fired power plant in 03050105-120, which should provide some growth to the area. Duke Power will buy water from the nearby Town of Blacksburg. The facility should be open by summer 2003.

Watershed Protection and Restoration Strategies

Special Projects

Grazing Land Watershed Protection and Enhancement Through Demonstration and Education

Of the 21,500 farms in South Carolina, 12,000 are involved in the production of beef cattle. Water quality impacts from cattle grazing include the addition of fecal coliform and nutrient enrichment from animal wastes, sedimentation, and riparian zone degradation. The objective of this project, funded by a USEPA Section 319 grant of the Clean Water Act and implemented by Clemson University, is to develop demonstration sites and provide demonstration workshops and written material to cattlemen on the BMP's necessary to protect and enhance the water quality of streams and ponds on grazing lands.

One demonstration site is located in this watershed on the Broad River below 99 Island. The demonstration will show how to exclude cattle from the Broad River, construct creek access ramps, and provide watering stations away from the river. The preference of cattle for using stream water or clean well water will also be evaluated. If clean well water is preferred, it would be a good alternative to fencing animals away from waterways. A ram pump will also be demonstrated along with techniques in rotational grazing.

03050105-100

(Buffalo Creek)

General Description

Watershed 03050105-100 is located in Cherokee County and consists primarily of ***Buffalo Creek*** and its tributaries. The watershed occupies 9,921 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Herndon-Helena-Goldston-Georgeville series. The erodibility of the soil (K) averages 0.34, and the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 65.8% forested land, 22.4% agricultural land, 8.6% urban land, 2.8% scrub/shrub land, and 0.4% barren land.

Bee Branch flows across the North Carolina border and drains into Buffalo Creek, which flows into the Broad River. There are a few ponds (totaling 6.6 acres) and19.5 stream miles in this watershed, all classified FW.

Water Quality

Station #	Type	Class	Description
B-740	BIO	FW	BUFFALO CREEK AT SC 198
B-119	S	FW	BUFFALO CREEK AT S-11-213, 2.2 MI NNW OF BLACKSBURG
B-057	S	FW	BUFFALO CREEK AT SC 5, 1 MI W OF BLACKSBURG

Buffalo Creek - There are three monitoring sites along Buffalo Creek. At the upstream site ***(B-740),*** aquatic life uses are fully supported based on macroinvertebrate community data. At the next site downstream ***(B-119),*** aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

At the furthest downstream site ***(B-057),*** aquatic life uses are partially supported due to occurrences of copper in excess of the aquatic life acute standards. In water, a very high concentration of cadmium and a very high concentration of chromium were measured in 1995 and indeno(1,2,3-cd)pyrene was detected in 1995. In sediment, bis(2-ethylhexyl)phthalate was measured in the 1997 sample and tetrachloroethene was detected in the 1998 sample. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BUFFALO CREEK SPEEDWAY #66/BLACKSBURG PIPE #: 002 FLOW: 0.0075 WQL FOR BOD5,DO,TRC,NH3N	SC0042196 MINOR INDUSTRIAL WATER QUALITY
BUFFALO CREEK TNS MILLS INC./BLACKSBURG PLT PIPE #: 001 FLOW: M/R	SCG250043 MINOR INDUSTRIAL EFFLUENT
BUFFALO CREEK TRIBUTARY BROAD RIVER TRUCK STOP PIPE #: 001 FLOW: 0.01 WQL FOR TRC,NH3N	SC0032433 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
MONSANTO TEXTILES CO. INDUSTRIAL	IWP-179 (SCD001700863) -------

Growth Potential

There is a moderate potential for growth in this watershed, which contains a portion of the Town of Blacksburg. Major growth is expected along the I-85 corridor, which stretches across the watershed. Commercial growth is also associated with the I-85 corridor near the Town of Blacksburg.

03050105-110

(Cherokee Creek)

General Description

Watershed 03050105-110 is located in Cherokee County and consists primarily of ***Cherokee Creek*** and its tributaries. The watershed occupies 14,911 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Goldston-Badin series. The erodibility of the soil (K) averages 0.22, and the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 36.8% forested land, 33.2% agricultural land, 22.1% urban land, 4.6% scrub/shrub land, 1.9% water, and 1.4% barren land.

Cherokee Creek flows through Lake Whelchel (180 acres) near the City of Gaffney and accepts drainage from Allison Creek in the lake and Providence Branch downstream of the lake before flowing into the Broad River. There are several ponds and lakes (totaling 219.9 acres) in this watershed and 16.6 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-056	S	FW	CHEROKEE CREEK AT US 29, 3 MI E OF GAFFNEY
B-679	BIO	FW	CHEROKEE CREEK AT SC 329

Cherokee Creek - There are two monitoring sites along Cherokee Creek. At the upstream site ***(B-056)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in total phosphorus concentration and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the downstream site ***(B-679)***, aquatic life uses are partially supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
PROVIDENCE BRANCH BPW/VICTOR GAFFNEY WTP PIPE #: 001 FLOW: 1.02 WQL FOR TRC	SCG645045 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CHEROKEE COUNTY LANDFILL DOMESTIC	111001-1101 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
BOREN BRICK HIGGINS RED CLAY PIT	0113-21 CLAY
BOREN BRICK SHALE PIT	0114-21 SHALE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF GAFFNEY BPW LAKE WHELCHEL	— 18.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains a portion of the City of Gaffney. The City of Gaffney is planning for new subdivision growth by considering new regional treatment facilities near the Cherokee Creek-Broad River area. Major growth is expected along the I-85 corridor, particularly in the area north of Gaffney. Commercial growth is also associated with the I-85 corridor near the S.C. Hwy. 11 interchange north of Gaffney and at the S.C. Hwy. 105 interchange with the new outlet center. The potential for industrial growth exists along S.C. Hwy. 329 east of Gaffney due to the existing industrial park.

03050105-120

(Kings Creek)

General Description

Watershed 03050105-120 is located in Cherokee and York Counties and consists primarily of ***Kings Creek*** and its tributaries. The watershed occupies 33,146 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Goldston-Badin series. The erodibility of the soil (K) averages 0.15, and the slope of the terrain averages 13%, with a range of 2-45%. Land use/land cover in the watershed includes: 79.1% forested land, 15.3% agricultural land, 3.5% scrub/shrub land, 1.2% urban land, 0.5% barren land, and 0.4% water.

Kings Creek originates in North Carolina and flows across the state line to accept drainage from Modlin Branch, Dixon Branch, Ponders Branch, Stonehouse Branch, Dellingham Branch, Mill Creek, and Jumping Branch. Further downstream, Garner Branch flows into Kings Creek followed by Manning Branch, Bells Branch, Beech Branch, Wolf Creek, and Nells Branch before draining into the Broad River. There are several recreational ponds and lakes in this watershed (totaling 27.0 acres) and 51.1 stream miles, all classified FW. Kings Mountain National Military Park and Kings Mountain State Park are additional natural resources in the watershed.

Water Quality

Station #	Type	Class	Description
B-333	W/BIO	FW	KINGS CREEK AT S-11-209, 3 MI W OF SMYRNA

Kings Creek (B-333) - Although two copper excursions occurred, aquatic life uses are fully supported based on macroinvertebrate community data. Recreational uses are partially supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
MILL CREEK TRIBUTARY VULCAN MATERIALS CO./BLACKSBURG PIPE #: 001, 002 FLOW: M/R	SCG730068 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
BLACKSBURG DUMP/ANTIOCH DOMESTIC	------ CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
BOREN BRICK SERICITE PIT	0115-21 SERICITE
VULCAN CONSTRUCTION MATERIALS BLACKSBURG QUARRY	0354-21 LIMESTONE
TAYLOR CLAY PRODUCTS CO. ROBERTS MINE	0221-21 SHALE
TAYLOR CLAY PRODUCTS CO. GROVER MINE	0199-21 MANGANESE SCHIST
INDUSTRIAL MINERALS, INC. KINGS CREEK MINE	0162-21 SERICITE

Growth Potential

There is an overall low potential for growth in this watershed, which contains a portion of the Town of Smyrna, due to the absence of public utilities. Duke Power is planning to build a natural gas-fired power plant, Mill Creek Station, near the top of the watershed, which is expected to bring some growth to the area. Duke Power will buy water from the nearby Town of Blacksburg. The facility should be open by summer 2003.

03050105-130

(Thicketty Creek)

General Description

Watershed 03050105-130 is located in Cherokee County and consists primarily of ***Thicketty Creek*** and its tributaries. The watershed occupies 100,753 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Pacolet-Wilkes-Herndon-Madison series. The erodibility of the soil (K) averages 0.30, and the slope of the terrain averages 16%, with a range of 2-45%. Land use/land cover in the watershed includes: 5.2% urban land, 19.7% agricultural land, 5.2% scrub/shrub land, 0.9% barren land, 68.4% forested land, and 0.6% water.

Thicketty Creek joins with Macedonia Creek to form Lake Thicketty at the top of the watershed. Thicketty Creek then accepts drainage from Thicketty Mountain Creek (Linder Creek), Clary Creek, Allgood Branch, and Irene Creek (Cole Creek) near the City of Gaffney. Little Thicketty Creek (Lake Rufus, Rocky Ford Creek, Cowpens Creek) enters Thicketty Creek next followed by Limestone Creek (Mill Creek, Skelton Creek) and Big Blue Branch (Blue Branch). North Goucher Creek and South Goucher Creek join in Hammett Lake to form Goucher Creek (Gum Root Creek), which flows into Thicketty Creek, downstream of Big Blue Branch. Jones Creek (Martin Lake) enters Thicketty Creek next followed by Timber Ridge Branch, Minkum Creek (Polecat Creek), Crocker Branch, Lusts Mill Creek, and Gilkey Creek. Gilkey Creek accepts drainage from Gaffney Country Club Lake, Blanton Creek, Peeler Branch, Spencer Branch (also known as Cartum Branch), Dry Fork Creek, Martin Branch, and Rocky Branch. Thicketty Creek drains into the Broad River. There are several ponds and lakes (totaling 515.5 acres) in this watershed and a total of 182.3 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-342	W	FW	LAKE THICKETTY IN FOREBAY NEAR DAM
B-059	S	FW	IRENE CREEK AT S-11-307, 2.5 MI W OF GAFFNEY
B-095	S	FW	THICKETTY CREEK AT S-11-164
B-128	S	FW	LIMESTONE CREEK AT S-11-301
B-133	S/BIO	FW	THICKETTY CREEK AT SC 18, 8.3 MI S OF GAFFNEY
B-334	W/BIO	FW	GILKEY CREEK AT S-11-231, 9 MI SE OF GAFFNEY
B-062	S/BIO	FW	THICKETTY CREEK AT SC 211, 2 MI ABOVE JUNCTION WITH BROAD RIVER

Thicketty Creek - There are three monitoring sites along Thicketty Creek. At the upstream site ***(B-095),*** aquatic life uses are fully supported. There is a significant decreasing trend in pH. Further downstream ***(B-133),*** aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters.

At the downstream site ***(B-062),*** aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. Significant decreasing trends in five-day biochemical oxygen

demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at any site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Lake Thicketty (B-342) - Lake Thicketty is a 100-acre impoundment on Thicketty and Macedonia Creeks in Cherokee County, with a maximum depth of approximately 20 feet (6.1 m), and an average depth of 10 feet (3.1 m). Lake Thicketty's watershed comprises 6.9 square miles (18 km2). Aquatic life and recreational uses are fully supported.

Irene Creek (B-059) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in turbidity suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Limestone Creek (B-128) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Gilkey Creek (B-334) - Aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Natural Swimming Areas

FACILITY NAME *RECEIVING STREAM*	*PERMIT #* *STATUS*
CAMP LEA LAKE RUFUS	11-N02 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
THICKETTY CREEK CITY OF GAFFNEY/CLARY WWTP PIPE #: 001 FLOW: 3.6 WQL FOR BOD5,DO,TRC,NH3N	SC0031551 MAJOR DOMESTIC WATER QUALITY
ALLGOOD BRANCH PINECONE CAMPGROUND WWTP PIPE #: 001 FLOW: 0.018 WQL FOR TRC,NH3N	SC0034002 MINOR DOMESTIC WATER QUALITY
IRENE CREEK NESTLE FROZEN FOODS CORP. PIPE #: 001 FLOW: 0.066	SC0037664 MINOR INDUSTRIAL WQL FOR TRC

SKELTON CREEK COLONIAL PIPELINE/GAFFNEY STATION PIPE #: 001 FLOW: M/R	SCR003084 MINOR INDUSTRIAL EFFLUENT
MILL CREEK HAMRICK MILLS/MUSGROVE MILLS PIPE #: 001 FLOW: M/R	SCG250168 MINOR INDUSTRIAL EFFLUENT
SPENCERS BRANCH BRIARCREEK SD II/UNITED UTILITIES PIPE #: 001 FLOW: 0.020 WQL FOR TRC,NH3N	SC0026409 MINOR DOMESTIC WATER QUALITY
SPENCERS BRANCH TRIBUTARY BRIARCREEK SD I/UNITED UTILITIES PIPE #: 001 FLOW: 0.0228 WQL FOR TRC,NH3N	SC0023736 MINOR DOMESTIC WATER QUALITY
JONES CREEK MEDLEY FARMS NPL SITE PIPE #: 001 FLOW: 0.041	SC0046469 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
LOVE SPRINGS/PIED INDUSTRIAL SERV. INDUSTRIAL	IWP-131 --------

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD BLANTON'S SEPTIC	ND0080489 DOMESTIC

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the City of Gaffney and the Town of Cowpens. Major growth is expected along the I-85 corridor, which stretches across the watershed, particularly in the area north of Gaffney. U.S. Hwy. 29 and a rail line also stretch across the watershed from Spartanburg through Cowpens to Gaffney.

03050105-140

(Bullock Creek)

General Description

Watershed 03050105-140 is located in York County and consists primarily of ***Bullock Creek*** and its tributaries. The watershed occupies 75,801 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil-Goldston-Badin series. The erodibility of the soil (K) averages 0.22, and the slope of the terrain averages 13%, with a range of 2-45%. Land use/land cover in the watershed includes: 76.6% forested land, 15.2% agricultural land, 7.0% scrub/shrub land, 0.6% barren land, 0.4% urban land, and 0.2% water.

Bullock Creek originates near the South Carolina/North Carolina border and accepts drainage from Gin Branch, Rocky Branch, Buckhorn Creek (Silver Creek), and Clark Fork. Clark Fork also originates near the state line and flows through Lake Crawford to join Jennings Branch and forms Lake York before accepting drainage from Biggers Branch and Saltlick Branch. Downstream of Clark Fork, Bullock Creek accepts drainage from Thompson Branch, Berry Branch, Purgatory Branch, Mitchell Branch, Plexico Branch, Loves Creek, and Bells Creek (Prater Branch, Dowdle Branch). There are a few ponds and lakes (totaling 161.4 acres) in this watershed and 123.2 stream miles, all classified FW. Kings Mountain State Park extends over the upper portion of the watershed along with Kings Mountain National Military Park.

Water Quality

Station #	Type	Class	Description
B-739	BIO	FW	BULLOCK CREEK AT S-46-40
B-325	S	FW	CLARK FORK INTO CRAWFORD LAKE NEAR SC 161 & 705
B-737	W	FW	LAKE YORK IN KINGS MOUNTAIN STATE PARK
B-326	S	FW	LONG BRANCH ON SC 216, BELOW KINGS MOUNTAIN PARK REC. AREA
B-157	BIO	FW	CLARK FORK AT S-46-63
B-159	S	FW	BULLOCK CREEK AT SC 97, 4.8 MI S OF HICKORY GROVE

Bullock Creek - There are two monitoring sites along Bullock Creek. At the upstream site ***(B-739),*** aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(B-159),*** aquatic life uses are fully supported. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Lake York (B-737) - Lake York, located in Kings Mountain State Park, is a 50-acre impoundment on Clark Fork. Lake York's maximum depth is approximately 13 feet (4.0 m); average depth is 9 feet (2.7 m). The lake's watershed comprises approximately 0.8 square miles (2 km2) in North and South Carolina. In an effort to provide access for swimming and boating, triploid grass carp were stocked in 1985, 1987, and 1993; and aquatic herbicides were applied in 1995. Aquatic life and recreational uses are fully supported.

Long Branch (B-326) - Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported.

Clark Fork - There are two monitoring sites along Clark Fork. At the upstream site ***(B-325)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported at this site. At the downstream site ***(B-157)***, aquatic life uses are fully supported based on macroinvertebrate community data.

Crawford Lake - Crawford Lake is located in Kings Mountain State Park. In an effort to provide public access for swimming and boating in Crawford Lake, triploid grass carp were stocked in 1985, 1987, and 1992; and aquatic herbicides were applied from 1990-1995. Recent efforts to clear access for boating and swimming include continuing to apply aquatic herbicide from 1996-1998, and again in 2000.

Natural Swimming Areas

FACILITY NAME / *RECEIVING STREAM*	*PERMIT #* / *STATUS*
KINGS MOUNTAIN STATE PARK LAKE CRAWFORD	46-N07 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / *FACILITY NAME* / *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* / *TYPE* / *LIMITATION*
LONG BRANCH US PARK SERVICE/KINGS MTN NATL MIL PARK PIPE #: 001 FLOW: 0.0095	SC0025275 MINOR INDUSTRIAL WQL FOR DO,TRC,NH3N

Nonpoint Source Management Program

Land Disposal Activities

Land Application Sites

LAND APPLICATION SYSTEM / *FACILITY NAME*	*ND#* / *TYPE*
SPRAYFIELD G & W INC.	ND0080748 INDUSTRIAL

Mining Activities

MINING COMPANY / *MINE NAME*	*PERMIT #* / *MINERAL*
YORK COUNTY BIGGERS #2 MINE	1220-91 SAND/CLAY

Growth Potential

There is a low potential for growth in this watershed, which contains portions of the Towns of Hickory Grove, Smyrna, and Sharon. Public water service is limited to Hickory and Sharon. Although the area is largely rural, residential activity is increasing as a result of the close proximity to the Town of Clover, the City of York, and the Greater Charlotte Metropolitan Area.

03050105-150

(North Pacolet River)

General Description

Watershed 03050105-150 is located in Spartanburg County and consists primarily of the ***North Pacolet River*** and its tributaries. The watershed occupies 31,549 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 65.8% forested land, 19.3% agricultural land, 11.4% urban land, 2.5% scrub/shrub land, 0.7% water, and 0.3% barren land.

The North Pacolet River originates in North Carolina and accepts drainage from Vaughn Creek (Lake Lanier) and Wolfe Creek, which originate in South Carolina. After flowing across the state line, the river accepts drainage from Page Creek. Hooper Creek, Collinsville Creek, and Bear Creek enter the river next; all originating in North Carolina. Obed Creek drains into the river at the base of the watershed. There are a few recreational lakes (totaling 103.5 acres) in this watershed and a total of 56.6 stream miles, all classified FW with the exception of Vaughn Creek, which is classified ORW.

Water Quality

Station #	Type	Class	Description
B-099-7	BIO	ORW	VAUGHN CREEK AT UNNUMBERED ROAD, 0.4 MI S OF S-23-319
B-099A	S	FW	LAKE LANIER ON # 1 INLET IN GREENVILLE COUNTY
B-099B	S	FW	LAKE LANIER AT DAM IN GREENVILLE COUNTY
B-719	BIO	FW	NORTH PACOLET RIVER AT S-42-128
B-301	S	FW	PAGE CREEK AT S-42-1258, 1.7 MI SE LANDRUM
B-026	P	FW	NORTH PACOLET RIVER AT S-42-956, 6.5 MI E LANDRUM
B-126	W	FW	NORTH PACOLET RIVER AT S-42-978, 1 MI SE OF FINGERVILLE
B-791	BIO	FW	OBED CREEK AT SR 42

North Pacolet River - There are three monitoring sites along the North Pacolet River. At the upstream site ***(B-719)***, aquatic life uses are fully supported based on macroinvertebrate community data. At the next downstream site ***(B-026)***, aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and total nitrogen concentrations suggest improving conditions for these parameters. PCB-1254 was measured in the 1996 sediment sample. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the downstream site ***(B-126)***, aquatic life uses are fully supported; however, a very high concentration of lead was measured in 1995. Recreational uses are not supported due to fecal coliform bacteria excursions.

Vaughn Creek (B-099-7) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Lake Lanier - There are two monitoring sites on Lake Lanier. At the uplake site ***(B-099A),*** aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration and a significant increasing trend in turbidity. There is a significant decreasing trend in pH. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. At the downlake site ***(B-099B)***, aquatic life uses are also fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported at this site.

Page Creek (B-301) – Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in turbidity suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Obed Creek (B-791) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
NORTH PACOLET RIVER SSSD/FINGERVILLE WWTP PIPE #: 001 FLOW: 0.020	SC0047759 MINOR DOMESTIC EFFLUENT
NORTH PACOLET RIVER MILLIKEN & CO./NEW PROSPECT MILL PIPE #: 001 FLOW: 0.47 WQL FOR DO,TRC,NH3N	SC0023540 MINOR INDUSTRIAL WATER QUALITY
NORTH PACOLET RIVER CITY OF LANDRUM/PAGE CREEK WWTP PIPE #: 001 FLOW: 0.5 (PHASE I) PIPE #: 001 FLOW: 1.0 (PHASE II) PIPE #: 001 FLOW: 2.0 (PROPOSED) WQL FOR DO,TRC,NH3N; UNDER CONSTRUCTION	SC0026875 MINOR DOMESTIC WATER QUALITY WATER QUALITY WATER QUALITY
NORTH PACOLET RIVER LITTLE ACRES SAND CO./N. PACOLET MINE PIPE #: 001 FLOW: M/R	SCG730177 MINOR INDUSTRIAL EFFLUENT
OBED CREEK HB SWOFFORD VOCATIONAL SCHOOL PIPE #: 001 FLOW: 0.0045 WQL FOR NH3N	SC0028037 MINOR DOMESTIC WATER QUALITY
PAGE CREEK CITY OF LANDRUM/PAGE CREEK WWTP PIPE #: 001 FLOW: 0.5 WQL FOR BOD5,TRC,NH3N; TO BE PHASED OUT	SC0026875 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
LITTLE ACRES SAND CO. NORTH PACOLET RIVER MINE	1037-83 SAND
SLATER PROPERTIES NORTH PACOLET SAND	1001-83 SAND
CHAPMAN GRADING & CONCRETE CO. MCMILLAN MINE	0383-83 SAND & GRAVEL

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF LANDRUM VAUGHN CREEK TRIBUTARY	0.2 0.2
CITY OF LANDRUM LAKE LANIER - VAUGHN CREEK	2.0 1.0
TOWN OF TRYON, N.C. LAKE LANIER	9.0 6.0

Growth Potential

There is a low potential for growth in this watershed, which contains a portion of the City of Landrum. I-26 bisects the watershed and some growth may result around interstate interchanges.

03050105-160

(South Pacolet River)

General Description

Watershed 03050105-160 is located in Spartanburg County and consists primarily of the ***South Pacolet River*** and its tributaries. The watershed occupies 58,528 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 9%, with a range of 2-25%. Land use/land cover in the watershed includes: 60.7% forested land, 21.7% agricultural land, 11.9% urban land, 3.4% water, 1.7% scrub/shrub land, and 0.5% barren land.

The South Pacolet River originates near Glassy Mountain and accepts drainage from Green Creek, Belue Creek, Jamison Mill Creek, Spivey Creek (Clear Branch), and Motlow Creek (Easley Creek, Holston Creek) before forming Lake Bowen (Alexander Creek, Turkey Creek). The South Pacolet River flows out of Lake Bowen to then form the South Pacolet River Reservoir #1 (Mud Creek) which is also known as Spartanburg Reservoir #1 (301 acres). There are numerous ponds and lakes in this watershed (totaling 1,483.3 acres) and 94.2 stream miles. With the exception of the headwaters of the South Pacolet River downstream to Hwy. 116, which is classified TN, all streams in the watershed are classified FW.

Water Quality

Station #	Type	Class	Description
B-720	BIO	FW	SOUTH PACOLET RIVER AT S-42-183
B-103	S	FW	SPIVEY CREEK AT S-42-208, 2.5 MI SSE OF LANDRUM
B-104	BIO	FW	SPIVEY CREEK AT SR 209
B-790	BIO	FW	MOTLOW CREEK AT SR 888
B-302	S	FW	SOUTH PACOLET RIVER AT S-42-866, 1 MI SE CAMPOBELLO
B-340	W	FW	LAKE BOWEN NEAR HEADWATERS, 0.4 KM W OF S-42-37
B-339	W	FW	LAKE BOWEN IN FOREBAY NEAR DAM
B-113	S	FW	SPARTANBURG RESERVOIR #1 ON S-42-213 NE OF INMAN

South Pacolet River - There are two monitoring sites along the South Pacolet River. At the upstream site ***(B-720)***, aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(B-302)***, aquatic life uses are also fully supported; however, a very high concentration of lead was measured in 1995. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total suspended solids, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Spivey Creek – There are two monitoring sites along Spivey Creek. At the upstream site ***(B-103)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. At the

downstream site ***(B-104)***, aquatic life uses are fully supported based on macroinvertebrate community data.

Motlow Creek (B-790) – Aquatic life uses are partially supported based on macroinvertebrate community data.

Lake Bowen - Lake William C. Bowen is a 1600-acre impoundment on the South Pacolet River in Spartanburg County, with a maximum depth of approximately 41 feet (12.5 m) and an average depth of 15 feet (4.7 m). Lake Bowen's watershed comprises 82 square miles (212.6 km2). There are two monitoring sites on Lake Bowen ***(B-340, B-339)***. Aquatic life and recreational uses are fully supported at both sites.

Spartanburg Reservoir #1 (B-113) - Aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentrations.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
MOTLOW CREEK LINKS O TRYON GOLF COMMUNITY PIPE #: 001 FLOW: 0.024 WQL FOR DO,TRC,NH3N	SC0042684 MINOR DOMESTIC WATER QUALITY
SOUTH PACOLET RIVER SPARTANBURG WATER SYSTEM WWTP/SIMMS WWTP PIPE #: 001 FLOW: 0.004 (PHASE I) PIPE #: 001 FLOW: 0.012 (PHASE II)	SC0030279 MINOR DOMESTIC EFFLUENT EFFLUENT
SOUTH PACOLET RIVER SPARTANBURG WATER SYSTEM/SIMMS WTP PIPE #: 001 FLOW: 1.17 WQL FOR TRC	SCG643002 MINOR DOMESTIC WATER QUALITY
SOUTH PACOLET RIVER LITTLE ACRES SAND CO./S.PACOLET MINE PIPE #: 001 FLOW: M/R	SCG730178 MINOR INDUSTRIAL EFFLUENT
SPIVEY CREEK CITY OF LANDRUM/WTP PIPE #: 001 FLOW: 0.032 WQL FOR TRC	SCG645029 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME / *FACILITY TYPE*	*PERMIT # / STATUS*
POTEAT SHORT TERM C&D LANDFILL C&D LANDFILL	422903-1301 ———

Land Application Sites

LAND APPLICATION SYSTEM / *FACILITY NAME*	*ND# / TYPE*
SPRAYFIELD CAMPOBELLO-GRAMBLING SCHOOL	ND0067342 DOMESTIC

Mining Activities

MINING COMPANY / *MINE NAME*	*PERMIT # / MINERAL*
LITTLE ACRES SAND CO. SOUTH PACOLET RIVER MINE	0805-83 SAND

Water Supply

WATER USER / *STREAM*	*TOTAL PUMP. CAPACITY (MGD) / RATED PUMP. CAPACITY (MGD)*
SPARTANBURG WATER SYSTEM SOUTH PACOLET RIVER RES.#1	——— 64.0

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the Town of Campobello and a portion of the City of Landrum. I-26 bisects the watershed and some growth may result around interstate interchanges.

03050105-170

(Pacolet River)

General Description

Watershed 03050105-170 extends through Spartanburg and Cherokee Counties and consists primarily of the ***Pacolet River*** and its tributaries from its origin at the confluence of the North and South Pacolet Rivers to Lawsons Fork Creek. The watershed occupies 73,661 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 11%, with a range of 2-45%. Land use/land cover in the watershed includes: 51.3% forested land, 28.7% agricultural land, 14.5% urban land, 3.3% scrub/shrub land, 1.6% water, and 0.6% barren land.

The Pacolet River is formed by the confluence of the North Pacolet River Watershed and the South Pacolet River Watershed. Downstream from the confluence, the Pacolet River accepts drainage from Thompson Creek and forms Lake Blalock (760 acres). Streams draining into Lake Blalock include Buck Creek, Little Buck Creek (Ezell Branch, Cudds Creek, Greenes Lake), and Casey Creek (Carlisle Branch). Downstream from the lake, the Pacolet River accepts drainage from Cherokee Creek (Little Cherokee Creek), Island Creek (Zekial Creek, Double Branch), Pole Bridge Branch, Peters Creek, Cinder Branch, Turkey Hen Branch, Quinn Branch, and Mill Branch. There are numerous lakes and ponds (totaling 978.8 acres) in this watershed and a total of 102.6 stream miles, all classified FW. Cowpens National Battlefield Site is located between Island Creek and Zekial Creek.

Water Quality

Station #	Type	Class	Description
B-028	S	FW	PACOLET R. AT S-42-55, BELOW CONFL. OF N. & S. PACOLET RIVERS
B-783	BIO	FW	BUCK CREEK AT PEACH SHED RD
B-259	S	FW	LITTLE BUCK CREEK AT COUNTY ROAD, 2.3 MI SW OF CHESNEE
B-347	W	FW	LAKE BLALOCK IN FOREBAY NEAR DAM
B-163A	S	FW	PACOLET RIVER AT BRIDGE ON S-42-737, 2.9 MI NW OF COWPENS
B-191	S	FW	POTTER BRANCH ON ROAD 30, BELOW OUTFALL FROM HOUSING PROJECT
B-331	W	FW	PACOLET RIVER AT S-42-59, BEACON LIGHT ROAD IN CLIFTON

Pacolet River - There are three monitoring sites along this section of the Pacolet River. Aquatic life uses are fully supported at the upstream site ***(B-028)***, and significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and total suspended solids concentration suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. Aquatic life and recreational uses are fully supported further downstream ***(B-163A);*** however, there is a significant increasing trend in total phosphorus concentration. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. At the downstream site ***(B-331),*** aquatic life uses are fully supported, and recreational uses are partially supported due to fecal coliform bacteria excursions.

Buck Creek (B-783) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Little Buck Creek (B-259) - Aquatic life uses are fully supported. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Taylor Blalock (B-347) - Lake Blalock in Spartanburg County is a 760-acre impoundment on the Pacolet River, with a maximum depth of approximately 49.5 feet (15 m) and an average depth of 5.6 feet (1.7 m). Lake Blalock's watershed comprises 273 square miles (707 km2), which includes Spartanburg Reservoir #1 and Lake Bowen, and extends into North Carolina. Aquatic life and recreational uses are fully supported.

Potter Branch (B-191) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
PACOLET RIVER SSSD/CLIFTON WWTP PIPE #: 001 FLOW: 0.29	SC0042668 MINOR DOMESTIC EFFLUENT
PACOLET RIVER ARTEVA SPECIALTIES SARL PIPE #: 002 FLOW: 0.800 PIPE #: 004 FLOW: 0.061 PIPE #: 010 FLOW: 0.216 WQL FOR DO,TRC	SC0002798 MAJOR INDUSTRIAL EFFLUENT EFFLUENT WATER QUALITY
PACOLET RIVER SSSD/TOWN OF COWPENS/PACOLET RIVER PIPE #: 001 FLOW: 1.5 WQL FOR TRC	SC0045624 MAJOR DOMESTIC WATER QUALITY
PROPOSED PACOLET RIVER SSSD/FAIRFOREST REGIONAL WWTF PIPE #: 001 FLOW: 30.0	SC0020435 MAJOR DOMESTIC WQL FOR TRC, NH3N
PACOLET RIVER TRIBUTARY OMEGA CHEMICALS, INC. PIPE #: 001 FLOW: 1.12	SCG250055 MINOR INDUSTRIAL EFFLUENT

CHEROKEE CREEK SAXONIA-FRANKE OF AMERICA, INC. PIPE #: 001 FLOW: 0.003	SCG250176 MINOR INDUSTRIAL EFFLUENT
CHEROKEE CREEK ARTEVA SPECIALTIES SARL PIPE #: 001 FLOW: 0.08	SC0002798 MAJOR INDUSTRIAL EFFLUENT
LITTLE CHEROKEE CREEK SPARTANBURG/LAKE BLALOCK WTP PIPE #: 001 FLOW: M/R	SCG645010 MINOR DOMESTIC EFFLUENT
LITTLE BUCK CREEK CITY OF CHESNEE/MAIN PLANT WWTP PIPE #: 001 FLOW: 0.500 WQL FOR NH3N	SC0025763 MINOR DOMESTIC WATER QUALITY
PETERS CREEK RR DONNELLEY & SONS CO. PIPE #: 001 FLOW: 0.1202 WQL FOR TRC; NH3N IN SUMMER & WINTER	SC0036102 MINOR INDUSTRIAL WATER QUALITY
PETERS CREEK SPECIALTY INDUSTRIAL PRODUCTS PIPE #: 001 FLOW: 0.0097 WQL FOR TRC	SC0037826 MINOR INDUSTRIAL WATER QUALITY
PETERS CREEK SSSD IDLEWOOD SD PIPE #: 001 FLOW: 0.08 WQL FOR TRC,NH3N	SC0030554 MINOR DOMESTIC WATER QUALITY
PETERS CREEK TRIBUTARY AIR LIQUIDE AMERICA CORP. PIPE #: 001 FLOW: M/R	SCG250046 MINOR INDUSTRIAL EFFLUENT
ISLAND CREEK TALL TALES FISH CAMP PIPE #: 001 FLOW: 0.0136	SC0031577 MINOR DOMESTIC EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
IRENE BISHOP SHORT TERM C&D LANDFILL	422904-1301 ———
DAVID STOLTZ SHORT TERM C&D LANDFILL	422422-1301 ———
HASKELL SEXTON SHORT TERM C&D LANDFILL	422484-1301 ———

J. DAVID MOORE INERT IND. LANDFILL INDUSTRIAL	IWP-224 -------
J DAVID MOORE INERT IND. LANDFILL CONSTRUCTION	CWP-047 -------
HOECHST CELANESE C&D LANDFILL INDUSTRIAL C&D LANDFILL	423312-1201 (SCD056811367) -------

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD SPARTANBURG WATER SYSTEM/SIMMS WTP	ND0074101 DOMESTIC
SPRAYFIELD SPARTANBURG WATER SYSTEM/LAKE BLALOCK WTP	ND0077135 DOMESTIC

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CHAPMAN GRADING & CONCRETE CO., INC. CHAPMAN SAND PLANT #6	1081-83 SAND

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the City of Chesnee, the Town of Mayo, and portions of the City of Spartanburg and the Town of Cowpens. In addition to Spartanburg area in the lower region of the watershed, growth is associated primarily with Chesnee and Cowpens, both having sewer infrastructure. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges.

03050105-180

(Lawsons Fork Creek)

General Description

Watershed 03050105-180 is located in Spartanburg County and consists primarily of ***Lawsons Fork Creek*** and its tributaries. The watershed occupies 54,415 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28, and the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 46.1% urban land, 34.5% forested land, 17.4% agricultural land, 1.0% scrub/shrub land, 0.6% barren land, and 0.4% water.

Lawsons Fork Creek originates near and flows past the City of Spartanburg before draining into the Pacolet River. Lawsons Fork Creek accepts drainage from Greene Creek (Meadow Creek), Camp Creek, Fawn Branch, Big Shoally Creek (Little Shoally Creek, Flatwood Lake, Fairview Lake), Betty Green Creek (Waldrops Lake), Chinquapin Creek, and Fourmile Branch. There are several ponds and lakes (totaling 145.2 acres) in this watershed and a total of 72.0 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-221	S/BIO	FW	LAWSONS FORK CREEK AT S-42-40, BELOW INMAN MILL EFFLUENT
B-277	S	FW	LAWSONS FORK CREEK AT S-42-218, 2.7 MI SSE OF INMAN
B-278	S	FW	LAWSONS FORK CREEK AT UNNUMBERED ROAD BELOW MILLIKEN CHEMICAL
B-531	BIO	FW	MEADOW CREEK AT SR 56
BL-005	S	FW	LAWSONS FORK CREEK AT S-42-79 AT VALLEY FALLS
BL-001	P/BIO	FW	LAWSONS FORK CREEK AT S-42-108

Lawsons Fork Creek - There are five monitoring sites along Lawsons Fork Creek and there is a significant decreasing trend in pH at all sites. At the furthest upstream site ***(B-221),*** aquatic life uses are partially supported based on macroinvertebrate community data; however, there is a significant increasing trend in total phosphorus concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

At the next site downstream ***(B-277),*** aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Further downstream ***(B-278),*** aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform

bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. At the next site downstream ***(BL-005),*** aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

At the furthest downstream site ***(BL-001),*** aquatic life uses are partially supported based on macroinvertebrate community data. A very high concentration chromium was measured in 1997 and there is a significant increasing trend in total nitrogen concentration. In sediment, a high concentration of chromium and the PAHs benzo(b)fluoranthene, benzo(a)pyrene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, benzo(ghi)perylene, benzo(a)anthracene were detected in the 1998 sample. Significant decreasing trends in five-day biochemical oxygen demand and total suspended solids suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Meadow Creek (B-531) - Aquatic life uses are fully supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
LAWSONS FORK CREEK MILLIKEN & CO./DEWEY PLT PIPE #: 001 FLOW: 0.374 WQL FOR DO,TRC,NH3N	SC0003581 MAJOR INDUSTRIAL WATER QUALITY
LAWSONS FORK CREEK SSSD/LAWSONS FORK PLANT PIPE #: 001 FLOW: 9.0-15.5 TO BE ELIMINATED; TIED INTO SSSD/FAIRFOREST WWTF	SC0020427 MAJOR DOMESTIC WQL FOR DO,TRC,NH3N
LAWSONS FORK CREEK CITY OF INMAN PIPE #: 001 FLOW: 0.477 (PHASE I) PIPE #: 001 FLOW: 1.000 (PHASE II) WQL FOR DO,TRC,NH3N	SC0021601 MINOR DOMESTIC WATER QUALITY WATER QUALITY
LAWSONS FORK CREEK INMAN MILLS WATER DISTRICT PIPE #: 001 FLOW: 0.175 WQL FOR DO,TRC,NH3N	SC0024414 MINOR DOMESTIC WATER QUALITY
LAWSONS FORK CREEK WISE FOODS INC. PIPE #: 001 FLOW: M/R	SCG250113 MINOR INDUSTRIAL EFFLUENT

LAWSONS FORK CREEK MILLIKEN/VALLEY FALLS PLT PIPE #: 001 FLOW: M/R CEASED OPERATION	SC0002747 MINOR INDUSTRIAL EFFLUENT
LAWSONS FORK CREEK TRIBUTARY DRAPER CORPORATION PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R	SCR001582 MINOR INDUSTRIAL EFFLUENT EFFLUENT
GREENE CREEK PHELPS DODGE HIGH PERFORMANCE PIPE #: 001 FLOW: M/R	SCG250039 MINOR INDUSTRIAL EFFLUENT
MEADOW CREEK INMAN STONE COMPANY, INC. PIPE #: 001 FLOW: M/R	SCG730084 MINOR INDUSTRIAL EFFLUENT
CHINQUAPIN CREEK NORTHSIDE ROBO CAR WASH PIPE #: 001 FLOW: M/R	SCG750002 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH WILLIAMS ENERGY/SPARTANBURG TERMINAL PIPE #: 001, 002 FLOW: M/R	SC0003549 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH ASHLAND PETROLEUM/SPARTANBURG PIPE #: 001, 002 FLOW: M/R	SCG340010 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH CROWN CENTRAL PETROLEUM CORP. PIPE #: 001 FLOW: M/R	SCG340007 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH MOTIVA ENTERPRISES LLC PIPE #: 001, 002 FLOW: M/R	SCG340001 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH CONOCO INC./SPARTANBURG TERM. PIPE #: 001 FLOW: M/R	SCG340006 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH PHILLIPS PIPELINE/SPARTANBURG PIPE #: 001 FLOW: 0.051 PIPE #: 002 FLOW: 0.428	SCG340011 MINOR INDUSTRIAL EFFLUENT EFFLUENT
FOURMILE BRANCH TRANSMONTAIGNE TERMINAL/SPARTANBURG PIPE #: 001 FLOW: M/R	SCG340002 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
KOHLER COMPANY IND. LANDFILL INDUSTRIAL	422442-1601 (IWP-228) ———
PAR GRADING & HAULING SHORT TERM C&D LANDFILL	422421-1301 (422627-1701) ———
DRAPER CORPORATION LANDFILL INDUSTRIAL	IWP-103 (SCD003340908) ———
BILL GARRETT INDUSTRIAL	IWP-184 ———
SOUTHERN WOOD PIEDMONT INDUSTRIAL	IWP-048 (SCT00001154) ———
SOUTHERN WOOD PIEDMONT INDUSTRIAL	IWP-067 (SCT00001154) ———

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD KOHLER COMPANY	ND0000892 INDUSTRIAL

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
INMAN STONE COMPANY., INC. INMAN QUARRY	0630-83 GRANITE

Growth Potential

There is a high potential for growth in this watershed, which contains the City of Inman and a portion of the City of Spartanburg. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges. There are also industrial developmental pressures along I-26, U.S. Hwy. 29, and U.S. Hwy. 221.

Watershed Protection and Restoration Strategies

Special Projects

Urban Watershed Protection and Enhancement through Stewardship and Education

The objective of this project, funded by a USEPA Section 319 grant of the Clean Water Act and currently being implemented by Clemson University, is to develop stewardship of urban-rural watersheds located in two major metropolitan areas of northwestern South Carolina. Princess Creek in Greenville County and Lawsons Fork Creek in Spartanburg County are targeted for the project efforts. Fecal coliform bacteria is a major concern in both watersheds. Sources of fecal coliform bacteria may be traced to mini-farms, faulty septic systems, wild animals, or improper housing and management of family pets. It may also enter creeks when the capacity of municipal waste treatment facilities is exceeded. Exceeding treatment capacity may be due to major rainfall events adding water to the system or when population growth and waste input exceeds waste treatment capacity. This occurs in watersheds that experience rapid urban, suburban, and rural development such as the Upstate region of South Carolina.

The strategy is to develop a grass roots movement in watersheds where none presently exists, educate stakeholders and managers on water quality protection and proper watershed management. Specifically, the strategy has a monitoring program and several Community Involvement and Education objectives. Volunteer stream monitoring teams will be developed to foster stewardship in targeted watersheds. Stream teams will be developed from area schools where programs like Adopt-a Stream will be made available. Existing civic, environmental groups, and other interested citizen groups will be provided presentations to develop stewardship interests. Educational materials will be developed for the specific areas of concern that were defined by the monitoring program, and will include Farm/Home-a-Syst type materials for pollution prevention. The Stewardship group, with the direction of the lead contact and the assistance of NRCS and Conservation District personnel, will develop a community water quality newsletter, and provide water quality educational materials at existing river/water fairs and city festivals.

03050105-190

(Pacolet River)

General Description

Watershed 03050105-190 is located in Union, Cherokee, and Spartanburg Counties and consists primarily of the ***Pacolet River*** and its tributaries from Lawsons Fork Creek to the Broad River. The watershed occupies 65,170 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Pacolet series. The erodibility of the soil (K) averages 0.27, and the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 71.9% forested land, 13.4% scrub/shrub land, 11.2% agricultural land, 2.3% urban land, 0.9% barren land, and 0.3% water.

This section of the Pacolet River accepts drainage from its upper reach (03050105-170), together with Richland Creek, Harvey Branch, Browns Branch, Plum Branch, and Mill Branch. Further downstream, Mill Creek (Jumping Run Creek, Eison Branch) enters the river followed by Sandy Run Creek, Peter Hawks Creek, Gault Creek, another Mill Creek, another Gault Creek, Big Creek, Kendrick Branch, and Reedy Branch. The Pacolet River drains into the Broad River. There are a few ponds and lakes (totaling 90.8 acres) in this watershed and a total of 114.0 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
BP-001	S	FW	PACOLET RIVER ABOVE DAM AT PACOLET MILLS
B-780	BIO	FW	MILL CREEK AT SR 73
B-048	P	FW	PACOLET RIVER AT SC 105, 6 MI ABOVE CONFLUENCE WITH BROAD RIVER

Pacolet River - There are two monitoring sites along this section of the Pacolet River, and a significant decreasing trend in five-day biochemical oxygen demand at both sites suggests improving conditions for this parameter. At the upstream site ***(BP-001)***, aquatic life uses are fully supported. There is a significant decreasing trend in pH. Aquatic life uses are also fully supported at the downstream site ***(B-048)***. Recreational uses are not supported at either site due to fecal coliform bacteria excursions.

Mill Creek (B-780) – Aquatic life uses are partially supported based on macroinvertebrate community data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
PACOLET RIVER SSSD/PACOLET MILLS WWTP PIPE #: 001 FLOW: 0.3	SC0044717 MINOR DOMESTIC EFFLUENT

PACOLET RIVER TRIBUTARY VULCAN MATERIALS CO./PACOLET QUARRY PIPE #: 001 FLOW: M/R	SCG730293 MINOR INDUSTRIAL EFFLUENT
MILL CREEK SPARTAN MILLS/ROSEMONT MILL PIPE #: 001 FLOW: 0.0122	SC0037371 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
DEATON SAND COMPANY DEATON SAND PIT	1016-83 SAND
VULCAN MATERIALS CO. PACOLET QUARRY	0062-83 GRANITE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of Jonesville and Pacolet. Public water and sewer services are available in Jonesville, and residential and commercial uses center around the town and along S.C. Hwy. 9.

03050106-010

(Broad River)

General Description

Watershed 03050106-010 is located Union, Chester, and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Pacolet River to the Tyger River. The watershed occupies 77,201 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Pacolet-Winnsboro series. The erodibility of the soil (K) averages 0.24, and the slope of the terrain averages 21%, with a range of 6-40%. Land use/land cover in the watershed includes: 77.3% forested land, 10.4% agricultural land, 8.4% scrub/shrub land, 2.7% water, 0.7% barren land, and 0.5% urban land.

This section of the Broad River accepts drainage from its upper reach, together with Robertson Branch, Fanning Creek (Sharps Creek), George Branch, Osborn Branch, and the Turkey Creek Watershed. Hughes Creek (Lake John D. Long, Vanderford Branch) enters the river next followed by the Browns Creek Watershed, McCluney Creek, Little Turkey Creek, Clarks Creek, Neals Creek (Hobsons Creek), Mineral Creek, Coxs Creek, and the Sandy River Watershed. There are several lakes and ponds (totaling 150.8 acres) in this watershed and 155.5 stream miles, all classified FW. The lower three-quarters of the watershed, below Turkey Creek, resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
B-344	W	FW	LAKE JOHN D. LONG IN FOREBAY NEAR DAM
B-778	BIO	FW	NEALS CREEK AT SR 86
B-046	P	FW	BROAD RIVER AT SC 72/215/121, 3 MI E OF CARLISLE

Broad River (B-046) – Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A very high concentration of cadmium was measured in 1997. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Neals Creek (B-778) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Lake John D. Long (B-344) - Lake John D. Long is a 78-acre impoundment on Hughes Creek in Union County, with a maximum depth of approximately 31 feet (9.4 m) and an average depth of 16 feet (4.9 m). Lake Long's watershed comprises approximately 1.9 square miles (5.0 km). In an effort to provide access for boating and fishing, triploid grass carp were stocked in 1991 and aquatic herbicides were applied in 1986, 1987, 1991 and 1994-1996. More recent efforts to clear access for boating and fishing include applying aquatic herbicide in 2000. Aquatic life uses are not supported due to pH excursions. Recreational uses are fully supported.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER CONE MILLS/CARLISLE PLT PIPE #: 001 FLOW: 2.0 PIPE #: 002 FLOW: 0.04 PIPE #: 003 FLOW: 0.12 WQL FOR TRC	SC0001368 MAJOR INDUSTRIAL EFFLUENT WATER QUALITY EFFLUENT
BROAD RIVER SCE&G/NEAL SHOALS HYDRO PIPE #: 001 FLOW: M/R	SC0002186 MINOR INDUSTRIAL EFFLUENT
BROAD RIVER LOCKHART TREATMENT FACILITY PIPE #: 001 FLOW: 0.169	SC0003051 MINOR DOMESTIC EFFLUENT
BROAD RIVER CLARIANT CORP./LEEDS PLT PIPE #: 001 FLOW: M/R	SC0022756 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
LEEDS HUNT CAMP/FAMILY BROAD RIVER TRIBUTARY	12-307-0008 ACTIVE
WOODS FERRY/FAMILY BROAD RIVER	12-307-0005 ACTIVE

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
BENNETT LANDFILL (SHORT TERM) CONSTRUCTION	122901-1301 ———
BENNETT C& D LANDFILL (LONG TERM) CONSTRUCTION	122493-1201 ———

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MCINTYRE SAND CO., INC. CUDD SAND MINE	0909-87 SAND

MCINTYRE SAND CO., INC. JORDAN FOWLER TRACT	1243-87 SAND
MCINTYRE SAND CO., INC. ASKEW MINE	0684-87 SAND
SLOAN CONSTRUCTION CO., INC. LOCKHART MINE	0471-87 SAND
UNION COUNTY CARLISLE PIT	0311-87 SAND

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF UNION BROAD RIVER	23.8 8.0
CARLISLE CONE MILLS BROAD RIVER	8.1 5.7

Growth Potential

There is a low potential for future growth in this watershed, which contains the Town of Lockhart and a portion of the Town of Carlisle. Public water and sewer services are available in Carlisle. The Sumter National Forest effectively excludes a large portion of the watershed from development.

03050106-020

(Turkey Creek)

General Description

Watershed 03050106-020 is located in York and Chester Counties and consists primarily of ***Turkey Creek*** and its tributaries. The watershed occupies 93,719 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil-Madison series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 77.5% forested land, 10.8% scrub/shrub land, 9.7% agricultural land, 1.2% urban land, 0.5% barren land, and 0.3% water.

Turkey Creek originates near the City of York, flowing out of Caldwell Lake and accepting drainage from Ross Branch (Lake Carolyn), Dry Fork, Little Turkey Creek (McClures Branch, Lindsey Creek), and Bryson Creek. Further downstream, Blue Branch enters Turkey Creek followed by Rainey Branch (Palmer Branch), Susybole Creek (Little Susybole Creek), Mill Creek (Rodens Creek), and McKelvy Creek. There are a few ponds and lakes (totaling 100.5 acres) in this watershed and a total of 190.9 stream miles, all classified FW. The lower tip of the watershed resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
B-086	S	FW	ROSS BRANCH AT SC 49, SW OF YORK
B-136	W/BIO	FW	TURKEY CREEK AT SC 9, 14 MI NW OF CHESTER

Turkey Creek (B-136) - Aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Ross Branch (B-086) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
LITTLE SUSYBOLE CREEK HANSON AGGREGATES SE/LOWRY QUARRY PIPE #: 001 FLOW: M/R	SCG730085 MINOR INDUSTRIAL EFFLUENT

SUSYBOLE CREEK TRIBUTARY MACK ESTATES PIPE #: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N; NOT CONSTRUCTED	SC0043095 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CARTERS LANDSCAPE & FARMS INDUSTRIAL	IWP-209 ———

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
REA CONSTRUCTION CO. SAND PIT #123 - TURKEY CREEK MINE	0177-91 SAND
REA CONSTRUCTION CO. SAND PIT #124 - SUSYBOLE CREEK MINE	0180-23 SAND
HANSON AGGREGATES SE LOWRYS QUARRY	0759-91 GRANITE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF YORK CALDWELL LAKE	4.1 2.2
CITY OF YORK ROSS BRANCH TRIBUTARY - LAKE CAROLYN	4.0 2.2

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the City of York and the Towns of Lowrys, Sharon, and McConnells. The City of York is located at the top of the watershed, and extends water and sewer service in and around the city. Residential and commercial development is expected to grow in these areas. The Sumter National Forest effectively excludes the lower tip of the watershed from development.

03050106-030

(Browns Creek)

General Description

Watershed 03050106-030 is located in Union County and consists primarily of ***Browns Creek*** and its tributaries. The watershed occupies 33,945 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Wilkes series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 13%, with a range of 2-40%. Land use/land cover in the watershed includes: 65.1% forested land, 17.3% agricultural land, 11.4% scrub/shrub land, 5.7% urban land, 0.3% barren land, and 0.2% water.

Big Browns Creek (Knox Creek, Bethlehem Creek, Meng Creek) originates near the City of Union and merges with Little Browns Creek to form Browns Creek. Gregorys Creek flows into Browns Creek just prior to its confluence with the Broad River. There are a few ponds in this watershed (totaling 58.6 acres) and 58.3 stream miles, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
B-064	S	FW	MENG CREEK AT SC 49, 2.5 MI E OF UNION
B-243	S	FW	TRIBUTARY TO MENG CREEK AT CULVERT ON S-44-384, 3 MI E OF UNION
B-155	W/BIO	FW	BROWNS CREEK AT S-44-86, 8 MI E OF UNION
B-335	W	FW	GREGORYS CREEK AT S-44-86, 8 MI E OF UNION

Browns Creek (B-155) - Although two copper excursions occurred, aquatic life uses are fully supported based on macroinvertebrate community data. A very high concentration of zinc was measured in 1995. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Meng Creek (B-064) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Unnamed tributary to Meng Creek (B-243) - Aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Gregorys Creek (B-335) - Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BIG BROWNS CREEK CITY OF UNION/MENG CREEK PLANT PIPE #: 001 FLOW: 1.0 WQL FOR DO,TRC,NH3N	SC0047236 MAJOR DOMESTIC WATER QUALITY
BIG BROWNS CREEK TRIBUTARY SONOCO PRODUCTS/PINCKNEY PLT PIPE #: 001 FLOW: 0.001 WQL FOR BOD5,DO,TRC,NH3N	SC0028789 MINOR INDUSTRIAL WATER QUALITY
MENG CREEK CITY OF UNION/WTP PIPE #: 001 FLOW: 0.062 WQL FOR TRC	SCG645028 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
UNION COUNTY SANITARY LANDFILL DOMESTIC	DWP-902 (DWP-116, DWP-049) CLOSED
UNION COUNTY SANITARY LANDFILL DOMESTIC	441001-1101 CLOSED
UNION COUNTY C&D LANDFILL CONSTRUCTION	441001-1201 ———

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains a portion of the City of Union and the unincorporated Monarch Mill Village. Water service is available in most of the watershed, and the area should continue to experience scattered residential development. The Sumter National Forest effectively excludes the lower portion of the watershed from development.

03050106-040

(Sandy River)

General Description

Watershed 03050106-040 is located in Chester County and consists primarily of the ***Sandy River*** and its tributaries. The watershed occupies 102,351 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Madison series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 3.41% urban land, 9.12% agricultural land, 3.28% scrub/shrub land, 0.22% barren land, 83.58% forested land, and 0.40% water.

The Sandy River accepts drainage from Chapel Branch and flows through Chester Reservoir (80 acres) near the City of Chester. Downstream from the reservoir, Dry Fork enters the river followed by Caney Fork Creek (Chester State Park Lake, Twomile Branch, Threemile Branch), Carter Branch, Bear Branch (Mountain Lakes), and Seely Creek (Julies Fork, Walkers Mill Branch, Rock Branch, Bond Branch, Long Branch, Gum Spring Branch). Further downstream, the river accepts drainage from Rocky Branch, Brushy Fork Creek (Smith Creek, Starne Branch), the Little Sandy River (Mobley Creek, Coon Creek), and Johns Creek. Chester State Park is located in this watershed and extends over Twomile Branch and Threemile Branch near the City of Chester. There are several ponds and lakes (10-138 acres) in this watershed and a total of 156.2 stream miles, all classified FW. The lower tip of the watershed resides within the Sumter National Forest.

Water Quality

Station #	Type	Class	Description
CL-023	W	FW	CHESTER STATE PARK LAKE, 100 M E OF SPILLWAY
B-074	S	FW	DRY FORK AT S-12-304, 2 MI SW OF CHESTER
B-075	S/BIO	FW	SANDY RIVER AT SC 215, 2.5 MI ABOVE CONFLUENCE WITH BROAD RIVER

Sandy River (B-075) - Aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. There is a significant decreasing trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions.

Chester State Park Lake (CL-023) - Chester State Park Lake is a 138-acre impoundment on Twomile Branch and Threemile Branch located within Chester State Park in Chester County. The maximum depth is approximately 17 feet (5.2 m) and the average depth is 8.9 feet (2.7 m). The lake's watershed comprises approximately 9.2 square miles (23.8 km2). Aquatic life and recreational uses are fully supported.

Dry Fork (B-074) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. In sediment, a very high concentration of chromium and a high concentration of nickel were measured in the 1995 sample; high concentrations of chromium were measured in the 1996, 1997, and 1999 samples; and

very high concentrations of cadmium, chromium, and zinc, and high concentrations of copper and nickel were measured in the 1998 sample. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
SANDY RIVER CITY OF CHESTER/SANDY RIVER WWTP PIPE #: 001 FLOW: 2.133 WQL FOR BOD5,DO,TRC,NH3N	SC0036081 MAJOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
CHESTER STATE PARK/FAMILY CHESTER STATE PARK LAKE	12-307-0001 ACTIVE
B&S FAMILY CAMPGROUND/FAMILY SEELY CREEK	12-307-0007 ACTIVE

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CITY OF CHESTER SANITARY LANDFILL DOMESTIC	DWP-069 (SCD002394070) CLOSED

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
PERCOLATION LAGOON HILLTOP MOBILE HOME PARK	ND0080535 DOMESTIC

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CHESTER COUNTY CHESTER COUNTY GRAVEL PIT	1128-23 GRAVEL

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the City of Chester and a portion of the Town of Lowrys. Water and sewer services are provided in and around Chester and will promote modest residential, commercial, and industrial growth. The majority of the watershed is rural in nature with a high degree of forestry activities. The Sumter National Forest effectively excludes the western edges of the watershed from development.

03050106-050

(Broad River)

General Description

Watershed 03050106-050 is located in Newberry and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Tyger River to the Parr Shoals dam. The watershed occupies 146,310 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodibility of the soil (K) averages 0.24, and the slope of the terrain averages 15%, with a range of 2-40%. Land use/land cover in the watershed includes: 76.6% forested land, 11.9% agricultural land, 7.5% water, 2.8% scrub/shrub land, 0.8% urban land, and 0.4% barren land.

This section of the Broad River accepts drainage from its upper reaches, together with the Tyger River Watershed, the Enoree River Watershed, Beaver Creek (McClures Creek, Chicken Creek, Storm Branch, Reedy Branch, Sandy Fork), Rocky Creek, and Terrible Creek. The Parr Shoals dam impounds the Broad River to form Parr Reservoir, which accepts drainage from Hellers Creek (Second Creek, Buck Branch) and Cannons Creek (Rocky Branch, Kerr Creek, Charles Creek, Mud Creek). Monticello Reservoir (7100 acres) is connected to Parr Reservoir by Frees Creek. There are numerous ponds and lakes (totaling 8,497.9 acres) in this watershed and a total of 243.5 stream miles, all classified FW. The Sumter National Forest and the Broad River Waterfowl Area are natural resources in the watershed.

Water Quality

Station #	Type	Class	Description
B-047	S	FW	BROAD RIVER AT SC 34, 14 MI NE OF NEWBERRY
B-151	BIO	FW	HELLERS CREEK AT SR 97
B-346	W	FW	PARR RESERVOIR 4.8 KM N OF DAM, UPSTREAM OF MONTICELLO RESERVOIR
B-751	BIO	FW	CANNONS CREEK AT US 176
B-328	P	FW	MONTICELLO RES., UPPER IMPOUNDMENT AT BUOY IN MIDDLE OF LAKE
B-327	P	FW	MONTICELLO RESERVOIR, LOWER IMPOUNDMENT BETWEEN LARGE ISLANDS
B-345	W	FW	PARR RESERVOIR IN FOREBAY NEAR DAM

Broad River (B-047) - Aquatic life uses are fully supported; however, there is a significant increasing trend in turbidity. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Hellers Creek (B-151) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Cannons Creek (B-751) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Monticello Reservoir - Monticello Reservoir is a 7100-acre divided impoundment that floods most of Frees Creek watershed in Fairfield County. The upper impoundment is a small recreational lake. The lower

impoundment is linked with Parr Reservoir on the Broad River via a pumped storage hydroelectric facility. Overall, the average depth of Monticello Reservoir is 59 feet (17.9 m) and the maximum depth in the lower impoundment is approximately 126 feet (38.4 m). The lake's watershed comprises approximately 17 square miles (44 km2).

Lake Monticello is comprised of two separate impoundments, and there is a monitoring site on each impoundment. At the upper impoundment site ***(B-328)***, aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total nitrogen concentration, and turbidity suggest improving conditions for these parameters. At the lower impoundment site ***(B-327)***, aquatic life uses are fully supported. A high concentration of zinc was measured in water in 1995. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. Recreational uses are fully supported at both sites.

Parr Reservoir - Parr Reservoir is a 4400-acre impoundment on the Broad River in Fairfield and Newberry Counties, linked with Monticello Reservoir via a pumped storage hydroelectric facility. Parr Reservoir's maximum depth is approximately 25 feet (7.6 m) and the average depth is 15 feet (4.6 m). The reservoir's watershed comprises approximately 4750 square miles (12,302 km2) in North and South Carolina. There are two monitoring sites on Parr Reservoir (uplake ***B-346***, downlake ***B-345***) and aquatic life and recreational uses are fully supported at both sites.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER SCE&G/PARR HYDRO STA. PIPE #: 001 FLOW: M/R	SC0001864 MINOR INDUSTRIAL EFFLUENT
MONTICELLO RESERVOIR SCE&G/SUMMER NUCLEAR STA. PIPE #: 001-013, 015, 016 FLOW: M/R PIPE #: 014 FLOW: 0.12 WQL DO,TRC; NH3N IN SUMMER & WINTER	SC0030856 MAJOR INDUSTRIAL WATER QUALITY WATER QUALITY
PARR RESERVOIR SCE&G/FAIRFIELD PUMPED STORAGE PIPE #: 001 FLOW: M/R	SC0035904 MINOR INDUSTRIAL EFFLUENT
CANNONS CREEK NCWSA/CANNONS CREEK WWTP PIPE #: 001 FLOW: 0.05	SC0048020 MINOR DOMESTIC EFFLUENT
CHARLES CREEK FOREST HILLS SD/ELBO INC. PIPE #: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N	SC0024571 MINOR DOMESTIC WATER QUALITY

ROCKY CREEK VULCAN MATERIALS CO./BLAIR QUARRY PIPE #: 001 FLOW: M/R	SCG730053 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
NEWBERRY COUNTY LANDFILL DOMESTIC	DWP-117 CLOSED
NEWBERRY COUNTY LANDFILL DOMESTIC	DWP-044 CLOSED
NEWBERRY COUNTY TRANSFER STATION DOMESTIC	361001-6001 ------

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYDIELD SHAKESPEARE PRODUCTS GROUP	ND0070033 INDUSTRIAL

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
TARMAC MID-ATLANTIC, INC. BLAIR QUARRY	0130-39 GRANITE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
VC SUMMER NUCLEAR STATION WTP MONTICELLO RESERVOIR	3.1 1.5

Growth Potential

There is a low to moderate potential for growth in this watershed, primarily associated with residential development around the reservoirs, the Towns of Prosperity and Pomaria, and the City of Newberry. The upper portion of the watershed is effectively excluded from development by the Sumter National Forest, and the overall lack of adequate utilities to serve the remaining area will limit growth.

03050106-060

(Broad River)

General Description

Watershed 03050106-060 is located in Richland, Newberry, and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Parr Shoals dam to its confluence with the Saluda River. The watershed occupies 148,609 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Tatum-Alpin-Herndon-Pacolet series. The erodibility of the soil (K) averages 0.29, and the slope of the terrain averages 13%, with a range of 2-25%. Land use/land cover in the watershed includes: 73.8% forested land, 15.6% urban land, 6.1% agricultural land, 2.0% scrub/shrub land, 2.2% water, 0.2% barren land, and 0.1% forested wetland.

This section of the Broad River accepts drainage from its upper reaches, together with Mayo Creek, Crims Creek (Rocky Creek, Summers Branch), Wateree Creek (Risters Creek), Boone Creek, Freshley Branch, Mussel Creek, and the Little River Watershed. Hollingshead Creek (Boyd Branch, Wildhorse Branch, Metz Branch, Hope Creek, Bookman Creek) enters the river next followed by the Cedar Creek Watershed, Nipper Creek, Nicholas Creek (Swygert Branch, Moccasin Branch), Slatestone Creek, and Burgess Creek. Crane Creek and Smith Branch enter the river at the base of the watershed near the City of Columbia. Sorghum Branch, Dry Branch (Crescent Lake, Stevensons Lake), Elizabeth Lake, and Cumbess Creek drain into Crane Creek followed by North Crane Creek. North Cane Creek accepts drainage from Beasley Creek (Robertson Branch, Lot Branch, Hawkins Branch), Swygert Creek, Dry Fork Creek, and Long Branch. A portion of the Broad River is diverted into the Broad River Canal in Columbia before flowing into the Congaree River. Although depicted in the upper Congaree River Watershed (03050110-010), the canal is associated with this lower Broad River watershed; therefore any facilities or stations in this area will be included in this watershed. There are several ponds and lakes (totaling 671.3 acres) in this watershed and a total of 262.5 stream miles, all classified FW. The Harbison State Forest is located next to the Broad River just downstream of Nicholas Creek and a Heritage Trust Preserve is located along Nipper Creek.

Water Quality

Station #	Type	Class	Description
B-800	BIO	FW	CRIMS CREEK AT SC 213
B-801	BIO	FW	WATEREE CREEK AT SR 698
B-236	P	FW	BROAD RIVER AT SC 213, 2.5 MI SW OF JENKINSVILLE
B-110	S	FW	ELIZABETH LAKE AT SPILLWAY ON US 21
B-081	BIO	FW	CRANE CREEK AT US 321
B-316	P	FW	CRANE CREEK AT S-40-43 UNDER I-20, NORTH COLUMBIA
B-280	P/BIO	FW	SMITH BRANCH AT N MAIN ST (US 21) IN COLUMBIA
B-337	W	FW	BROAD RIVER AT US 176 (BROAD RIVER ROAD) IN COLUMBIA
B-080	P	FW	BROAD RIVER DIVERSION CANAL AT COLUMBIA WATER PLANT

Broad River - There are three monitoring sites along this section of the Broad River. At the upstream site ***(B-236)***, aquatic life uses are fully supported; however, there is a significant increasing trend in turbidity.

In water, P,P'DDE (a metabolite of DDT) was detected in the 1995 sample. In sediment, P,P'DDE was detected in the 1999 sample; benzo(b)fluoranthene and chrysene were measured once in 1997; phenanthrene was measured twice in 1997; pyrene was measured in 1997 and 1999; and fluoranthene was measured twice in 1997 and again in 1999. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. Recreational uses are fully supported at this site. Further downstream ***(B-337),*** aquatic life uses are fully supported, but recreational uses are partially supported due to fecal coliform bacteria excursions.

In the drinking water diversion canal ***(B-080),*** aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life acute standards. A very high concentration of chromium was measured in 1995. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter.

Crims Creek (B-800) – Aquatic life uses are partially supported based on macroinvertebrate community data.

Wateree Creek (B-801) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Elizabeth Lake (B-110) - Aquatic life uses are fully supported. This appears to be a blackwater lake, characterized by naturally low pH and dissolved oxygen concentrations. Although pH excursions occurred, they were typical of values seen in blackwater systems and were considered natural, not standards violations. There is a significant increasing trend in pH. Recreational uses are partially supported due to fecal coliform bacteria excursions. In addition, there was a significant increasing trend in fecal coliform bacteria concentrations.

Crane Creek - There are two monitoring sites along Crane Creek. At the upstream site ***(B-081),*** aquatic life uses are partially supported based on macroinvertebrate community data. At the downstream site ***(B-316),*** aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standards, including a very high concentration of zinc measured in 1996. P,P'DDD (a metabolite of DDT) was detected in the 1997 sediment sample, and P,P'DDT and P,PDDE (another metabolite of DDT) were measured in the 1999 sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. A significant decreasing trend in total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter.

Smith Branch (B-280) – Aquatic life uses are not supported based on macroinvertebrate community data and occurrences of zinc in excess of the aquatic life acute standards, including a very high concentration of

zinc measured in 1996. In addition, a very high concentration of chromium was measured in 1995 and there is a significant increasing trend in total phosphorus concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER MARTIN MARIETTA/N. COLUMBIA QUARRY PIPE #: 001 FLOW: M/R	SCG730066 MINOR INDUSTRIAL EFFLUENT
BROAD RIVER RAINTREE ACRES SD/MIDLANDS UTILITIES PIPE #: 001 FLOW: 0.14	SC0039055 MINOR DOMESTIC EFFLUENT
BROAD RIVER TOWN OF CHAPIN PIPE #: 001 FLOW: 1.2 PIPE #: 001 FLOW: 2.4 (PROPOSED)	SC0040631 MAJOR DOMESTIC EFFLUENT EFFLUENT
BROAD RIVER RICHLAND COUNTY BROAD RIVER WWTP PIPE #: 001 FLOW: 2.5	SC0046621 MAJOR DOMESTIC EFFLUENT
MAYO CREEK SCE&G/SUMMER NUCLEAR TRAINING CTR PIPE #: 001 FLOW: 0.004 WQL FOR TRC	SC0038407 MINOR INDUSTRIAL WATER QUALITY
CRANE CREEK PEPSI COMPANY/COLUMBIA PIPE #: 001 FLOW: M/R	SCG250021 MINOR INDUSTRIAL EFFLUENT
CRANE CREEK RICHTEX BRICK CORP. PIPE #: 001 FLOW: 0.008 WQL FOR DO,TRC,NH3N	SC0031640 MINOR INDUSTRIAL WATER QUALITY
CRANE CREEK DITCH COLUMBIA I-20 AUTO TRUCK CTR PIPE #: 001 FLOW: M/R	SC0035416 MINOR INDUSTRIAL EFFLUENT
BEASLEY CREEK MODINE MANUFACTURING CO. PIPE #: 001 FLOW: M/R	SCG250133 MINOR INDUSTRIAL EFFLUENT
NIPPER CREEK VULCAN MATERIALS CO./DREYFUS QUARRY PIPE #: 001 FLOW: M/R	SCG730052 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
WOODSMOKE CAMPGROUND/FAMILY WILDHORSE BRANCH	40-307-0011 ACTIVE
CAPITAL CITY CAMPGROUND/FAMILY CRANE CREEK TRIBUTARY	40-307-0003 ACTIVE

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
RICHLAND COUNTY SANITARY LANDFILL DOMESTIC	401001-1101 (DWP-065) CLOSED
RICHLAND COUNTY C&D LANDFILL	401002-1201 ———
OLD CITY OF COLUMBIA LANDFILL DOMESTIC	——— CLOSED
DARTMOUTH AVENUE C&D DUMP C&D LANDFILL	——— CLOSED
KNIGHTNER STREET C&D DUMP C&D LANDFILL	——— ———
CRAWFORD ROAD C&D DUMP C&D LANDFILL	——— ———
BREAZIO ROAD C&D DUMP C&D LANDFILL	——— ———
ETHELS AVENUE C&D DUMP C&D LANDFILL	——— ———
RICHTEX BRICK CORP. INDUSTRIAL	403302-1601 ———
CAROLINA WRECKING ST C&D LC LANDFILL C&D LANDFILL	402451-1301 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MARTIN MARIETTA MATERIALS NORTH COLUMBIA QUARRY	0099-79 GRANITE
MARTIN MARIETTA MATERIALS HARBISON QUARRY	0101-79 SHALE

RICHARDSON CONSTRUCTION CO. RICHARDSON'S MONTICELLO	0738-79 CLAY
BORAL BRICK, INC. LABORDE MINE	0448-79 CLAY
RICHTEX CORPORATION MANNING	0538-79 SHALE
TARMAC MID-ATLANTIC, INC. DREYFUS QUARRY	0129-79 GRANITE

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF COLUMBIA BROAD RIVER CANAL	90.0 72.0

Growth Potential

There is a high potential for growth in this watershed, which contains the northwest portion of the Greater Columbia Metropolitan Area and ample water and sewer service. In addition, the watershed contains the Town of Peak and portions of the Towns of Irmo, Chapin, Little Mountain, and Blythewood. The I-26, I-20, and I-77 corridors, along with the U.S. Hwy. 321, U.S. Hwy. 21, and U.S. Hwy. 176 corridors, will serve to increase residential, commercial, and industrial growth in the Greater Columbia Area. The northwest portion of the city (St. Andrews, Irmo, and Harbison) will continue to develop as a regional commercial hub for the area. Industrial development along the I-77 corridor is expected to remain strong due to the aggressive economic development policy by the City of Columbia and Richland County. The Killian and Blythewood areas in particular are expected to see increased construction activity. There is a high potential for growth on the eastern edge of the watershed, in Northeast Richland County. New commercial developments (The Village at Sandhills, Rice Creek Village, Sparkleberry Square, Sparkleberry Crossing) are being constructed and are expected to further increase the growth of a rapidly growing residential area.

03050106-070

(Little River)

General Description

Watershed 03050106-070 is located in Fairfield, Chester, and Richland Counties and consists primarily of the ***Little River*** and its tributaries. The watershed occupies 117,734 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 91.3% forested land, 4.4% agricultural land, 3.6% scrub/shrub land, 0.4% urban land, 0.2% barren land, and 0.1% water.

Big Creek and Little Creek join to form the headwaters of the Little River near the Town of Blackstock. Downstream of the confluence, the Little River accepts drainage from Camp Branch, Brushy Fork Creek (Dumpers Creek), the West Fork Little River (Weir Creek, Spring Branch, Williams Creek, Opossum Branch), Lick Branch, and Harden Branch. The Jackson Creek Watershed drains into the river next followed by Crumpton Creek, the Mill Creek Watershed, Morris Creek, Gibson Branch (Manns Branch, Russell Creek), and Home Branch. The Little River drains into the Broad River. There are a few ponds and lakes (totaling 115.2 acres) in this watershed and a total of 229.8 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-145	S/BIO	FW	LITTLE RIVER AT S-20-60, 3.1 MI SW OF JENKINSVILLE

Little River (B-145) - Aquatic life uses are fully supported based on macroinvertebrate community data and physical/chemical data. A very high concentration of zinc was measured in 1995. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
MORRIS CREEK MARTIN MARIETTA/RION QUARRY PIPE #: 001 FLOW: M/R	SCG730060 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Management Program

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
GLENN'S 6-10 CAMPGROUND/FAMILY LITTLE RIVER TRIBUTARY	20-307-0012 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MARTIN MARIETTA MATERIALS RION QUARRY	0100-39 GRANITE

Growth Potential

There is a low potential for growth in this watershed due to the absence of public utilities.

03050106-080

(Jackson Creek/Mill Creek)

General Description

Watershed 03050106-080 is located in Fairfield County and consists primarily of ***Jackson Creek and Mill Creek*** and their tributaries. The watershed occupies 37,525 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Wilkes series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 77.8% forested land, 9.9% agricultural land, 9.5% urban land, 2.1% scrub/shrub land, 0.9% water, and 0.2% barren land.

Jackson Creek is created by the confluence of Winnsboro Branch and Moore Creek near the Town of Winnsboro. Jackson Creek accepts drainage from Jordan Branch, Kennedy Creek, Sand Creek, Stitt Branch, and Gladney Branch before flowing into the Little River. Mill Creek drains into the Little River downstream of Jackson Creek. There are several ponds and lakes (totaling 378.1 acres) in this watershed and a total of 54.8 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-123	S	FW	WINNSBORO BRANCH AT US 321, ABOVE WINNSBORO MILLS OUTFALL
B-077	S	FW	WINNSBORO BRANCH BELOW PLANT OUTFALL
B-102	W/BIO	FW	JACKSON CREEK AT S-20-54, 5 MI W OF WINNSBORO
B-338	W	FW	MILL CREEK AT S-20-48, 10 MI SW OF WINNSBORO

Jackson Creek (B-102) - Aquatic life uses are partially supported based on macroinvertebrate community data. A very high concentration of chromium was measured in 1995. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Winnsboro Branch - There are two monitoring sites along Winnsboro Branch. At the upstream site ***(B-123),*** aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. At the downstream site ***(B-077),*** aquatic life uses are not supported due to occurrences of copper and zinc in excess of the aquatic life acute standards, including a high concentration of zinc measured in 1997. A very high concentration of chromium was measured in 1995. There is a significant increasing trend in total phosphorus concentration. P,P'DDD (a metabolite of DDT) was detected in the 1996 sediment sample and a very high concentration of nickel was measured in the 1998 sample. Recreational uses are not supported at either site due to fecal coliform bacteria excursions.

Mill Creek (B-338) - Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
JACKSON CREEK TOWN OF WINNSBORO/JACKSON CREEK PLANT PIPE #: 001 FLOW: 1.6 WQL FOR BOD5,DO,TRC,NH3N	SC0020125 MAJOR DOMESTIC WATER QUALITY
JACKSON CREEK TRIBUTARY UNIROYAL GOODRICH TIRE MFG. PIPE #: 001 FLOW: M/R	SCG250148 MINOR INDUSTRIAL EFFLUENT
JORDAN BRANCH ROYAL HILL SD/MIDLANDS UTILITY PIPE #:001 FLOW: M/R	SC0031046 MINOR DOMESTIC EFFLUENT

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CHAMBERS FAIRFIELD COUNTY SW TRANSFER STA. DOMESTIC	202400-6001 ———
FAIRFIELD COUNTY LANDFILL DOMESTIC	DWP-090; DWP-024 CLOSED

Water Supply

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
TOWN OF WINNSBORO SAND CREEK	0.7 0.5
TOWN OF WINNSBORO MILL CREEK - 192 ACRE LAKE	8.0 3.1

Growth Potential

There is a low potential for growth in this watershed except for in and around the City of Winnsboro, where water and sewer services exist. The recent closings of the Mack Truck and the Fuji Copian Winnsboro plants will further lower the potential for growth in the watershed.

03050106-090

(Cedar Creek)

General Description

Watershed 03050106-090 is located in Fairfield and Richland Counties and consists primarily of ***Cedar Creek*** and its tributaries. The watershed occupies 64,579 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Herndon-Helena-Georgeville series. The erodibility of the soil (K) averages 0.39, and the slope of the terrain averages 11%, with a range of 2-25%. Land use/land cover in the watershed includes: 0.8% urban land, 7.4% agricultural land, 1.4% scrub/shrub land, 90.1% forested land, and 0.3% water.

Big Cedar Creek originates near the Town of Ridgeway and accepts drainage from Center Creek (Rock Dam Creek), Persimmon Fork, Horse Creek, Williams Branch (Big Branch), and Little Cedar Creek (Crooked Run Creek, Bethel Pond, Smith Branch, Chappel Branch). Big Cedar Creek merges with Harmon Creek (Little Horse Branch, Elkins Creek) to form Cedar Creek, which flows into the Broad River. There are a few ponds and lakes (totaling 133.8 acres) in this watershed and a total of 150.0 stream miles, all classified FW.

Water Quality

Station #	Type	Class	Description
B-320	W/BIO	FW	BIG CEDAR CREEK AT SC 215

Big Cedar Creek (B-320) - Aquatic life uses are fully supported. Recreational uses are partially supported due to fecal coliform bacteria excursions. A total maximum daily load (TMDL) has been developed to address this impairment (see Watershed Protection and Restoration Strategies below).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
CEDAR CREEK TRIBUTARY TOWN OF RIDGEWAY WWTP PIPE #: 001 FLOW: 0.12 WQL FOR BOD5,DO,TRC,NH3N	SC0022900 MINOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
TRAPP/DERRICK LANE ST C&D LANDFILL CONSTRUCTION	202900-1301 ---
TNT SANDS C&D LANDFILL CONSTRUCTION	402423-1201 ---

Growth Potential

There is a low potential for growth in the majority of this watershed. Portions of the Towns of Ridgeway and Blythewood are located along the eastern edge of the watershed. Water and sewer services are available in the Blythewood area, which is expected to be a moderate to high growth area.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A total maximum daily load (TMDL) for fecal coliform has been developed for Cedar Creek. Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Between 1991 and 1995, 25% of the samples collected at station B-320 exceeded the 400 colonies/100ml standard. Targeting agricultural land for reduction of bacteria is the most effective strategy for this watershed.

A target level for fecal coliform bacteria of 175 colonies/100ml was established. This translates to an agricultural bacterial loading reduction of 52%. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use.

There are several tools available for implementing this TMDL, including Nonpoint Source (NPS) pollution outreach activities and materials. SCDHEC will continue to monitor water quality in Cedar Creek to evaluate the effectiveness of these measures.

Funding for TMDL implementation activities is currently available. For more information, see the Bureau of Water web page www.scdhec.net/water or call the Watershed Program at (803) 898-4300.

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APPENDIX A.

Enoree River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03050108-010			
BE-001	P	FW	ENOREE RIVER AT UNNUMBERED ROAD W OF U.S. 25, N OF TRAVELERS REST
B-797	BIO	FW	ENOREE RIVER AT PINE LOG FORD RD., 2ND CROSSING ABOVE SC 253 BRIDGE
BE-039	S	FW	BEAVERDAM CREEK AT ROAD 1967
B-796	BIO	FW	BEAVERDAM CREEK AT SC 253
B-795	BIO	FW	BUCKHORN CREEK AT SR 562
B-186	S	FW	MOUNTAIN CREEK AT S-23-335
BE-008	BIO	FW	MOUNTAIN CREEK AT SR 279
B-192	P	FW	PRINCESS CREEK AT SUBER MILL RD, SECOND ROAD S OF US 29 OFF S-23-540
BE-015	S	FW	ENOREE RIVER AT COUNTY ROAD 164
BE-035	S/BIO	FW	BRUSHY CREEK AT HOWELL RD (AT SR 273), APPROX 5 MI NE OF GREENVILLE
BE-009	S	FW	BRUSHY CREEK AT S-23-164
BE-007	S	FW	ROCKY CK AT BATESVILLE BRIDGE, 1 MI ABOVE CONFL. WITH ENOREE R.
B-792	BIO	FW	ABNER CREEK AT BENNETTS RIDGE RD.
BE-017	P	FW	ENOREE RIVER AT SC 296, 7.5 MI NE OF MAULDIN
BE-040	S	FW	GILDER CREEK AT SC 14, ABOVE GILDERS CREEK PLANT
B-241	S	FW	GILDER CREEK AT S-23-142, 2.75 MI ENE OF MAULDIN
B-793	BIO	FW	HORSEPEN CREEK AT SR 145
BE-020	S	FW	GILDER CREEK AT S-23-143, 1/4 MI ABOVE CONFLUENCE WITH ENOREE RIVER
BE-018	S/BIO	FW	ENOREE RIVER AT S-30-75
BE-019	BIO	FW	ENOREE RIVER AT SC 418
B-037	S	FW	ENOREE RIVER AT S-42-118, SW OF WOODRUFF
B-038	S	FW	LICK CREEK AT S-42-118, 1 1/4 MI SW WOODRUFF
B-035	S	FW	DURBIN CREEK ON S-23-160, 3 MI E OF SIMPSONVILLE
B-097	P	FW	DURBIN CREEK AT SC 418
BE-022	BIO	FW	DURBIN CREEK AT SC 101
B-040	W	FW	ENOREE RIVER AT S-30-112
03050108-020			
B-041	P	FW	ENOREE RIVER AT SC 49, SE OF WOODRUFF
B-785	BIO	FW	CEDAR SHOALS CK AT UNNAMED RD 0.2 KM ABOVE CONFL.WITH ENOREE RIVER
B-053	W	FW	ENOREE RIVER AT SC 72, 121, & US 176, 1 MI NE WHITMIRE
03050108-030			
B-246	W/BIO	FW	BEAVERDAM CREEK AT S-30-97, 7 MI NE OF GRAY COURT
B-150	W	FW	WARRIOR CREEK AT US 221, 8 MI NNE OF LAURENS
B-742	BIO	FW	WARRIOR CREEK AT SC 49
03050108-040			
B-735	W	FW	DUNCAN CREEK RESERVOIR 6B
B-231	S	FW	BEARDS FORK CREEK AT US 276 (I-385), 3.7 MI NNE OF CLINTON
B-072	P/BIO	FW	DUNCAN CREEK AT US 176, 1.5 MI SE OF WHITMIRE
03050108-050			
B-071	BIO	FW	INDIAN CREEK AT US 176
B-799	BIO	FW	KINGS CREEK AT US 176, DOWNSTREAM OF BRIDGE
B-054	P	FW	ENOREE RIVER AT S-36-45, 3.5 MI ABOVE CONFLUENCE WITH BROAD RIVER

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.net/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for
- W = Special watershed station added for the Broad River Basin study
- BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1995 and December 1999.
For trends, number of surface samples collected between January 1984 and December 1999.
For total phosphorus, an additional trend period of January 1992 to December 1999 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1995 and December 1999. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1995 and December 1999

Key to Trends:

- D Statistically significant decreasing trend in parameter concentration
- I Statistically significant increasing trend in parameter concentration
- * No statistically significant trend
- Blank Insufficient data to test for long term trends

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050108010																				
BE-001	P	ENOREE RVR	FW	55	0	0		*	172		D	173	-0.04	57	2	4	5.8	D	169	-0.01
B-797	BIO	ENOREE RVR	FW																	
BE-039	S	BEAVERDAM CK	FW	26	0	0		I	77	0.079	D	79	-0.152	28	1	4	5.9	D	79	-0.033
B-796	BIO	BEAVERDAM CK	FW																	
B-795	BIO	BUCKHORN CK	FW																	
B-186	S	MOUNTAIN CK	FW	28	0	0		*	76		D	76	-0.05	27	0	0		*	73	
BE-008	BIO	MOUNTAIN CK	FW																	
B-192	P	PRINCESS CK	FW	59	0	0		*	126		*	125		58	4	7	4.947	I	123	0.083
BE-015	S	ENOREE RVR	FW	30	1	3	2.3	I	80	0.11	D	79	-0.086	30	0	0		I	80	0.013
BE-035	S/BIO	BRUSHY CK	FW	27	0	0		*	75		D	74	-0.032	27	1	4	2.37	*	73	
BE-009	S/BIO	BRUSHY CK	FW	30	0	0		*	80		D	80	-0.02	30	0	0		*	80	
BE-007	S/BIO	ROCKY CK	FW	30	0	0		I	79	0.037	D	79	-0.071	30	0	0		*	79	
B-792	BIO	ABENERS CK	FW																	
BE-017	P	ENOREE RVR	FW	59	0	0		*	55		D	55	-0.5	59	0	0		I	55	0.083
BE-040	S	GILDER CK	FW	29	0	0		*	80		D	80	-0.033	29	0	0		*	79	
B-241	S	GILDER CK	FW	31	0	0		I	81	0.073	D	81	-0.15	31	0	0		I	80	0.022
B-793	BIO	HORSE PEN CK	FW																	
BE-020	S/BIO	GILDER CK	FW	31	0	0		I	80	0.1	D	79	-0.1	31	0	0		I	79	0.031
BE-018	S/BIO	ENOREE RVR	FW	29	0	0		I	76	0.067	D	74	-0.078	29	0	0		*	76	
BE-019	BIO	ENOREE RVR	FW																	
B-037	S	ENOREE RVR	FW	28	0	0		*	77		D	77	-0.038	28	0	0		D	77	-0.013
B-038	S	LICK CK	FW	30	0	0		I	77	0.05	D	77	-0.067	30	0	0		*	77	
B-035	S	DURBIN CK	FW	31	0	0		I	81	0.097	D	81	-0.117	31	0	0		*	80	
B-097	P	DURBIN CK	FW	59	0	0		I	126	0.02	D	125	-0.04	60	1	2	5.85	D	126	-0.02
BE-022	BIO	DURBIN CK	FW																	
B-040	BD	ENOREE RVR	FW	21	0	0								22	1	5	5.75			
03050108020																				
B-041	P	ENOREE RVR	FW	58	0	0		*	168		D	170	-0.038	59	1	2	5.95	D	166	-0.01
B-785	BIO	CEDAR SHOALS CK																		
B-053	BD	ENOREE RVR	FW	21	1	5	4.2							21	0	0				

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS (92-99) TP	N	MAG	TRENDS (85-99) TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050108010																		
BE-001	P	ENOREE RVR	FW	*	84		*	167		*	158		*	172				
B-797	BIO	ENOREE RVR	FW															
BE-039	S	BEAVERDAM CK	FW	*	34		D	76	-0.03				D	77	-0.394			
B-796	BIO	BEAVERDAM CK	FW															
B-795	BIO	BUCKHORN CK	FW															
B-186	S	MOUNTAIN CK	FW	*	33		D	73	0.0				*	74				
BE-008	BIO	MOUNTAIN CK	FW															
B-192	P	PRINCESS CK	FW	*	81		*	119		*	61		*	125				
BE-015	S	ENOREE RVR	FW	*	37		D	77	-0.02				*	79				
BE-035	S/BIO	BRUSHY CK	FW	*	30		D	69	0.0				*	72				
BE-009	S/BIO	BRUSHY CK	FW	*	38		D	78	0.0				*	79				
BE-007	S/BIO	ROCKY CK	FW	*	37		D	77	-0.002				*	78				
B-792	BIO	ABENERS CK	FW															
BE-017	P	ENOREE RVR	FW	*	53		*	53		*	52		D	53	-3.95			
BE-040	S	GILDER CK	FW	*	37		D	77	-0.001				*	79	"			
B-241	S	GILDER CK	FW	*	35		D	76	-0.008				D	80	-0.325			
B-793	BIO	HORSE PEN CK	FW															
BE-020	S/BIO	GILDER CK	FW	*	31		D	73	-0.017				*	79				
BE-018	S/BIO	ENOREE RVR	FW	*	34		D	75	-0.017				*	73				
BE-019	BIO	ENOREE RVR	FW															
B-037	S	ENOREE RVR	FW				D	69	-0.016				*	75				
B-038	S	LICK CK	FW	*	33		D	73	-0.002				*	75				
B-035	S	DURBIN CK	FW	*	36		D	76	-0.011				D	80	-0.47			
B-097	P	DURBIN CK	FW	*	75		D	116	-0.006	*	71		*	125				
BE-022	BIO	DURBIN CK	FW															
B-040	BD	ENOREE RVR	FW															
03050108020																		
B-041	P	ENOREE RVR	FW	*	81		D	160	-0.007	D	155	-0.027	*	167				
B-785	BIO	CEDAR SHOALS CK																
B-053	BD	ENOREE RVR	FW															

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050108010																	
BE-001	P	ENOREE RVR	FW	209	57	21	37	1,308	I	173	8.3	53	0	18	0	10	0
B-797	BIO	ENOREE RVR	FW														
BE-039	S	BEAVERDAM CK	FW	468	28	18	64	1,103	I	78	24						
B-796	BIO	BEAVERDAM CK	FW														
B-795	BIO	BUCKHORN CK	FW														
B-186	S	MOUNTAIN CK	FW	853	27	15	56	3,891	I	74	22						
BE-008	BIO	MOUNTAIN CK	FW														
B-192	P	PRINCESS CK	FW	86	59	19	32	1,601	I	126	13.5	57	0	19	0	10	0
BE-015	S	ENOREE RVR	FW	437	30	13	43	1,710	I	79	17.5						
BE-035	S/BIO	BRUSHY CK	FW	1,391	27	25	93	2,899	*	74							
BE-009	S/BIO	BRUSHY CK	FW	647	30	18	60	1,786	I	79	23						
BE-007	S/BIO	ROCKY CK	FW	428	30	12	40	1,839	*	78							
B-792	BIO	ABENERS CK	FW														
BE-017	P	ENOREE RVR	FW	450	58	20	34	4,686	D	54	-35	58	0	19	0	10	0
BE-040	S	GILDER CK	FW	1,364	29	25	86	10,399	I	80	70						
B-241	S	GILDER CK	FW	653	31	25	81	1,360	I	81	47.1						
B-793	BIO	HORSE PEN CK	FW														
BE-020	S/BIO	GILDER CK	FW	765	30	17	57	2,768	I	79	23.6						
BE-018	S/BIO	ENOREE RVR	FW	851	28	16	57	4,076	*	74							
BE-019	BIO	ENOREE RVR	FW														
B-037	S	ENOREE RVR	FW	330	28	9	32	4,296	*	77							
B-038	S	LICK CK	FW	757	30	19	63	8,850	*	77							
B-035	S	DURBIN CK	FW	632	31	23	74	1,205	*	80							
B-097	P	DURBIN CK	FW	740	60	48	80	1,411	I	126	40	55	0	18	0	10	0
BE-022	BIO	DURBIN CK	FW														
B-040	BD	ENOREE RVR	FW	242	22	3	14	687				20	0	7	0	10	0
03050108020																	
B-041	P	ENOREE RVR	FW	247	59	14	24	1,001	*	170		56	0	20	1	10	5
B-785	BIO	CEDAR SHOALS CK															
B-053	BD	ENOREE RVR	FW	178	22	7	32	549				20	0	8	0	10	0

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050108010																								
BE-001	P	ENOREE RVR	FW	18	1	10	5.6	18	0	0	18	0	0	18	0	0.2	0	18	0	20	0	18	18	100
B-797	BIO	ENOREE RVR	FW																					
BE-039	S	BEAVERDAM CK	FW																					
B-796	BIO	BEAVERDAM CK	FW																					
B-795	BIO	BUCKHORN CK	FW																					
B-186	S	MOUNTAIN CK	FW																					
BE-008	BIO	MOUNTAIN CK	FW																					
B-192	P	PRINCESS CK	FW	19	0	10	0	19	0	0	19	1	5	19	0	0.2	0	19	0	20	0	19	3	16
BE-015	S	ENOREE RVR	FW																					
BE-035	S/BIO	BRUSHY CK	FW																					
BE-009	S/BIO	BRUSHY CK	FW																					
BE-007	S/BIO	ROCKY CK	FW																					
B-792	BIO	ABENERS CK	FW																					
BE-017	P	ENOREE RVR	FW	19	0	10	0	19	2	11	19	0	0	19	0	0.2	0	19	0	20	0	19	1	5
BE-040	S	GILDER CK	FW																					
B-241	S	GILDER CK	FW																					
B-793	BIO	HORSE PEN CK	FW																					
BE-020	S/BIO	GILDER CK	FW																					
BE-018	S/BIO	ENOREE RVR	FW																					
BE-019	BIO	ENOREE RVR	FW																					
B-037	S	ENOREE RVR	FW																					
B-038	S	LICK CK	FW																					
B-035	S	DURBIN CK	FW																					
B-097	P	DURBIN CK	FW	18	0	10	0	18	0	0	18	0	0	18	0	0.2	0	18	0	20	0	18	0	0
BE-022	BIO	DURBIN CK	FW																					
B-040	BD	ENOREE RVR	FW	7	0	10	0	7	1	14	7	0	0	8	0	0.2	0	7	0	20	0	7	0	0
03050108020																								
B-041	P	ENOREE RVR	FW	20	1	10	5	20	0	0	20	0	0	20	0	0.2	0	19	0	20	0	20	3	15
B-785	BIO	CEDAR SHOALS CK																						
B-053	BD	ENOREE RVR	FW	8	0	10	0	8	0	0	8	0	0	7	0	0.2	0	8	0	20	0	8	0	0

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (85 -99)						pH	pH	pH	MEAN	TRENDS (85-99)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050108030																				
B-246	BD/BIO	BEAVERDAM CK	FW	21	0	0								22	2	9	5.45			
B-150	BD	WARRIOR CK	FW	21	0	0								22	1	5	5.8			
B-742	BIO	WARRIOR CK	FW																	
03050108040																				
B-735	BD	DUNCAN CK RES. 6B	FW	10	0	0								10	2	20	7.3			
B-231	S	BEARDS FORK CK	FW	28	10	36	4.44	I	78	0.1	D	79	-0.145	29	0	0		D	78	-0.025
B-072	P/BIO	DUNCAN CK	FW	56	0	0		*	127		*	116		56	1	2	8.57	*	127	
03050108050																				
B-071	BIO	INDIAN CK	FW																	
B-799	BIO	KINGS CK	FW																	
B-054	P	ENOREE RVR	FW	57	0	0		D	172	-0.039	I	160	0.025	57	0	0		*	172	

ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050108030																		
B-246	BD/BIO	BEAVERDAM CK	FW															
B-150	BD	WARRIOR CK	FW															
B-742	BIO	WARRIOR CK	FW															
03050108040																		
B-735	BD	DUNCAN CK RES. 6B	FW															
B-231	S	BEARDS FORK CK	FW	*	35		D	76	-0.006				D	78	-0.809			
B-072	P/BIO	DUNCAN CK	FW	*	74		D	112	-0.002	*	74		*	116				
03050108050																		
B-071	BIO	INDIAN CK	FW															
B-799	BIO	KINGS CK	FW															
B-054	P	ENOREE RVR	FW	*	79		*	161		*	158		I	159	0.75	*	148	

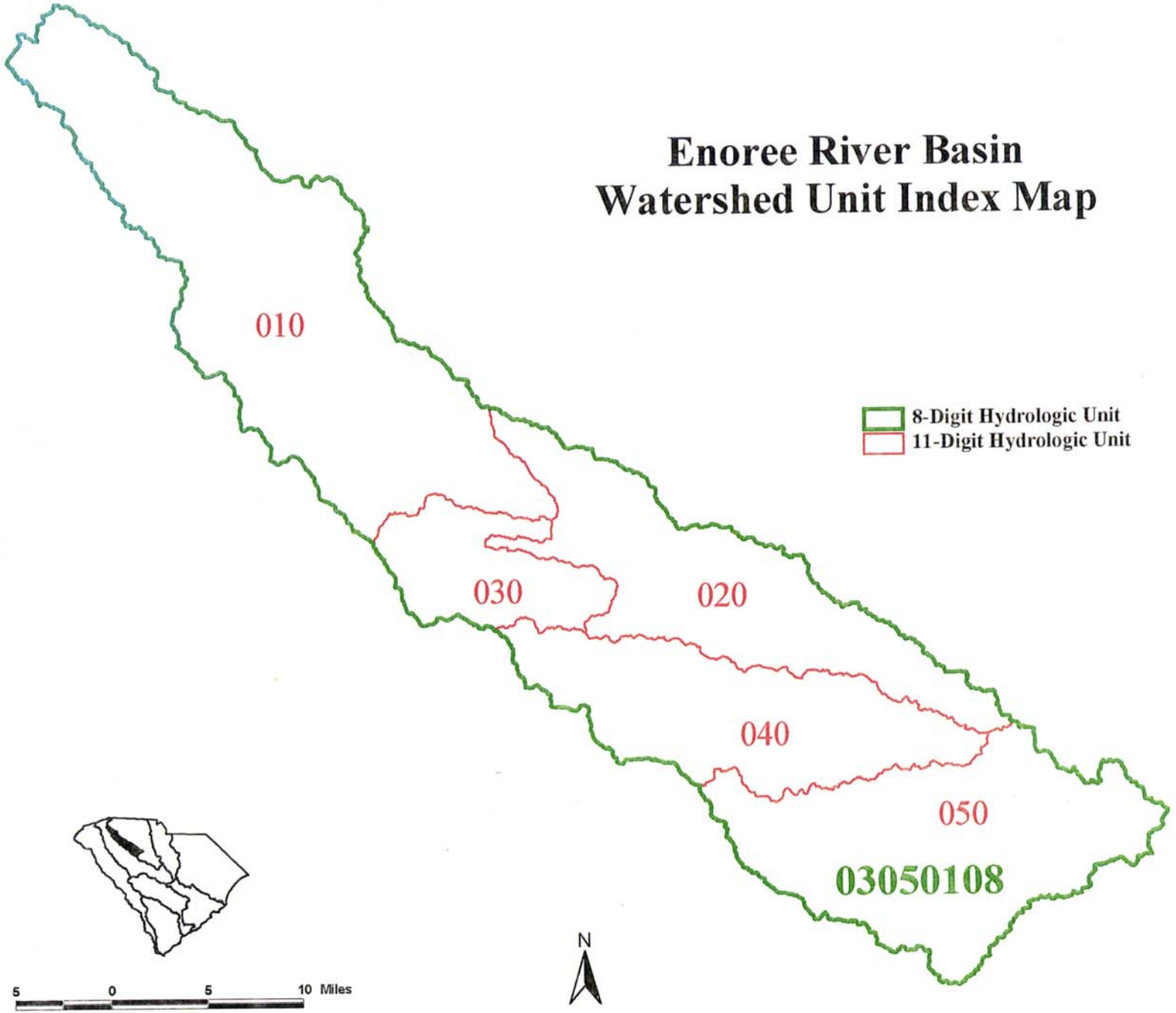
ENOREE RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050108030																	
B-246	BD/BIO	BEAVERDAM CK	FW	519	22	14	64	1,244				22	0	8	0	10	0
B-150	BD	WARRIOR CK	FW	428	22	7	32	1,203				20	0	7	1	10	14
B-742	BIO	WARRIOR CK	FW														
03050108040																	
B-735	BD	DUNCAN CK RES. 6B	FW	9	6	0	0					6	0				
B-231	S	BEARDS FORK CK	FW	104	29	3	10	2,320	I	77	3.3	1	0				
B-072	P/BIO	DUNCAN CK	FW	744	53	33	62	2,589	*	116		51	0	19	0	10	0
03050108050																	
B-071	BIO	INDIAN CK	FW														
B-799	BIO	KINGS CK	FW														
B-054	P	ENOREE RVR	FW	256	55	16	29	2,488	*	162		57	0	19	0	10	0

ENOREE RIVER BASIN WATER QUALITY SUMMARY

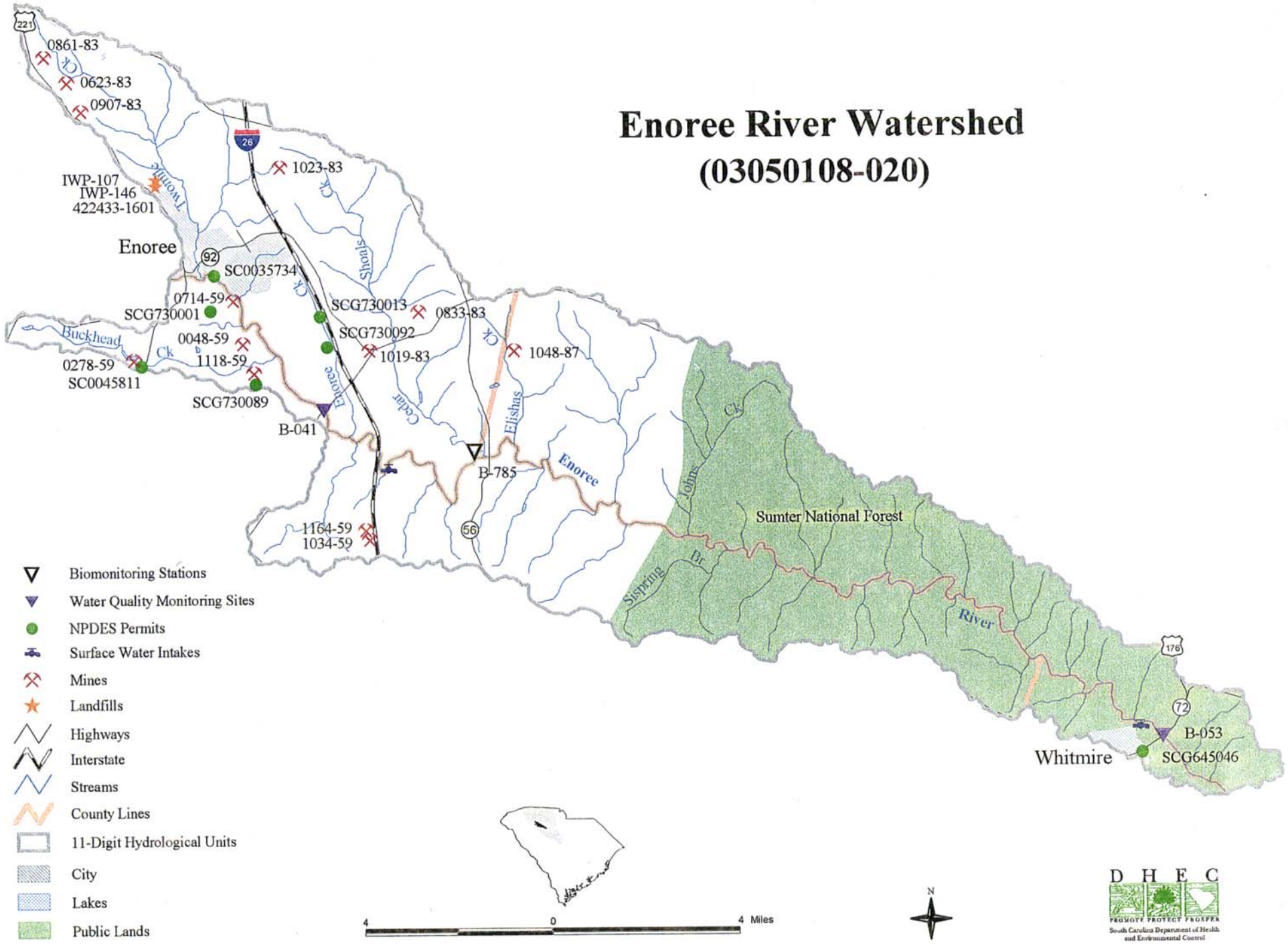
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050108030																								
B-246	BD/BIO	BEAVERDAM CK	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
B-150	BD	WARRIOR CK	FW	7	1	10	14	7	1	14	7	0	0	6	0	0.2	0	7	0	20	0	7	1	14
B-742	BIO	WARRIOR CK	FW																					
03050108040																								
B-735	BD	DUNCAN CK RES. 6B	FW																					
B-231	S	BEARDS FORK CK	FW																					
B-072	P/BIO	DUNCAN CK	FW	19	1	10	5.3	19	0	0	19	0	0	18	0	0.2	0	19	0	20	0	19	1	5
03050108050																								
B-071	BIO	INDIAN CK	FW																					
B-799	BIO	KINGS CK	FW																					
B-054	P	ENOREE RVR	FW	19	2	10	11	19	0	0	19	0	0	19	0	0.2	0	19	0	20	0	19	0	0

Enoree River Basin
Watershed Unit Index Map



D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Enoree River Watershed
(03050108-010)


Enoree River Watershed
(03050108-020)
0861-83
0623-83
0907-83
1023-83
IWP-107
IWP-146
422433-1601
Enoree
SC0035734
0714-59
SCG730001
SCG730013
0833-83
SCG730092
1019-83
1048-87
0048-59
1118-59
0278-59
SC0045811
SCG730089
B-041
B-785
1164-59
1034-59
Sumter National Forest
B-053
SCG645046
Whitmire
Biomonitoring Stations
Water Quality Monitoring Sites
NPDES Permits
Surface Water Intakes
Mines
Landfills
Highways
Interstate
Streams
County Lines
11-Digit Hydrological Units
City
Lakes
Public Lands
4 0 4 Miles
N
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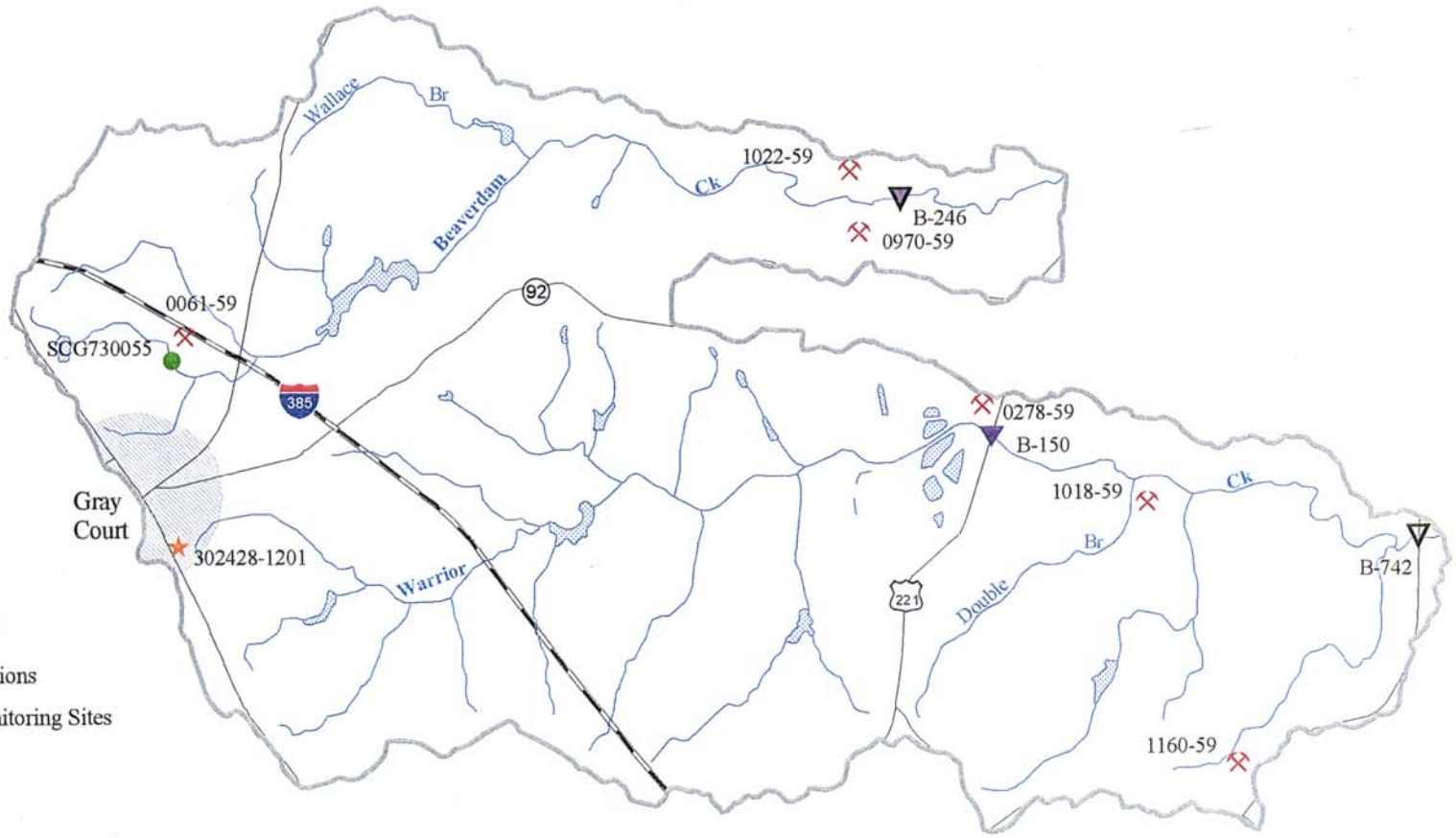
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Beaverdam Creek/Warrior Creek Watershed
(03050108-030)



- Biomonitoring Stations
- Water Quality Monitoring Sites
- NPDES Permits
- Mines
- Landfills
- Highways
- Interstate
- Streams
- County Lines
- 11-Digit Hydrological Units
- City
- Lakes

2 0 2 Miles

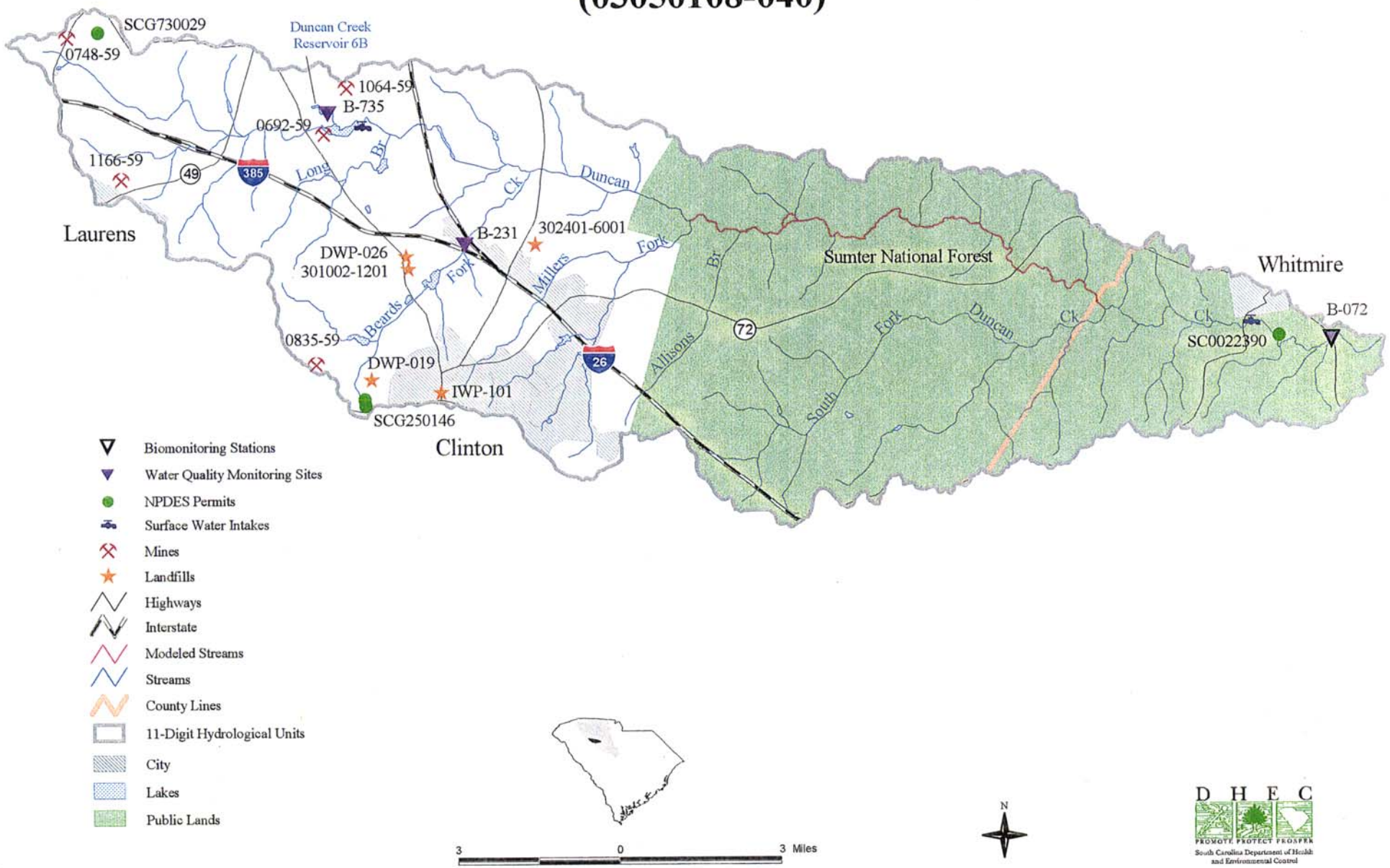
N

D H E C

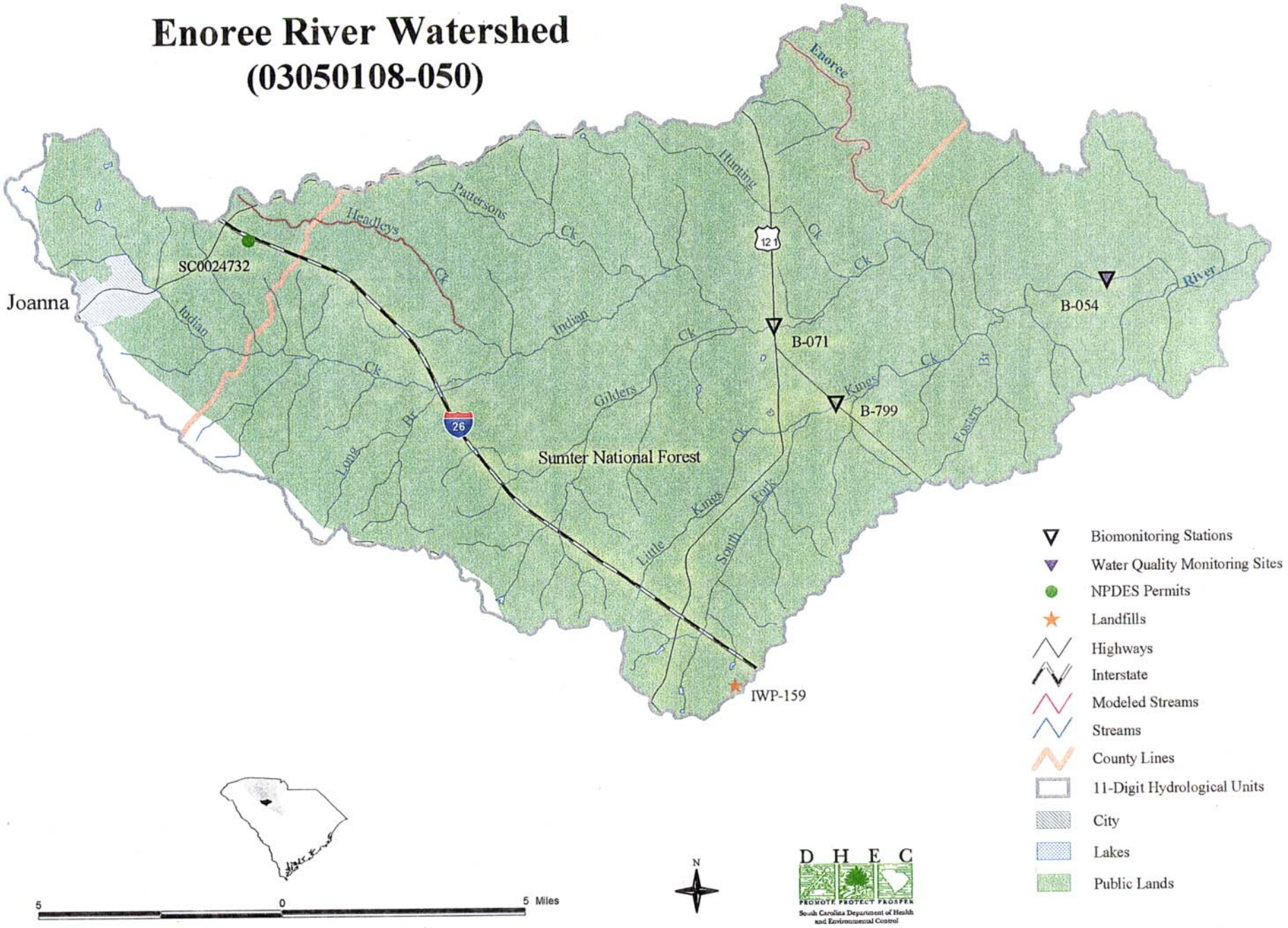
PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Duncan Creek Watershed
(03050108-040)



Enoree River Watershed
(03050108-050)



APPENDIX B.

Tyger River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03050107-010			
B-317	P	FW	MUSH CREEK AT SC 253, BELOW TIGERVILLE
B-741	BIO	FW	SOUTH TYGER RIVER AT UNNUMBERED ROAD, S OF S-23-569
CL-100	W	FW	LAKE ROBINSON IN FOREBAY NEAR DAM
B-341	W	FW	LAKE CUNNINGHAM IN FOREBAY NEAR DAM
B-149	S	FW	SOUTH TYGER RIVER AT SC 14, 2.9 MI NNW OF GREER
B-263	S	FW	SOUTH TYGER RIVER AT SC 290, 3.7 MI E OF GREER
B-625	BIO	FW	MAPLE CREEK AT SR 644
B-005A	BIO	FW	SOUTH TYGER RIVER AT S-42-242
B-005	S	FW	SOUTH TYGER RIVER AT S-42-63
B-782	BIO	FW	BENS CREEK AT SC 417
B-332	W	FW	SOUTH TYGER RIVER AT S-42-86, 5 MI NE OF WOODRUFF
B-787	BIO	FW	FERGUSON CREEK AT SR 86
03050107-020			
B-348	W	FW	LAKE COOLEY IN FOREBAY NEAR DAM
B-315	S	FW	TRIB. TO N.TYGER RIVER AT UNNUMBERED ROAD BELOW JACKSON #2
B-219	S	FW	NORTH TYGER RIVER AT US 29, 7.2 MI W OF SPARTANBURG
03050107-030			
B-017	BIO	FW	NORTH TYGER RIVER AT SC 296
B-018A	S	FW	NORTH TYGER RIVER AT S-42-231, 11 MI S OF SPARTANBURG
03050107-040			
B-794	BIO	FW	MIDDLE TYGER RIVER AT RED TURNER RD, 0.5 MI E. OF SC 101
B-148	P/BIO	FW	MIDDLE TYGER RIVER AT SC 14, 2 MI SSW GOWANSVILLE
B-784	BIO	FW	BEAVERDAM CREEK AT SC 357
B-012	S	FW	MIDDLE TYGER RIVER AT S-42-63
B-014	W/BIO	FW	MIDDLE TYGER RIVER AT S-42-64
03050107-050			
B-008	P	FW	TYGER RIVER AT S-42-50, E. OF WOODRUFF
B-019	S	FW	JIMMIES CREEK AT S-42-201, 2 MI E. OF WOODRUFF
B-786	BIO	FW	JIMMIES CREEK AT STEWART RD, 1 MI UPSTREAM OF SR 113
B-733	BIO	FW	DUTCHMAN CREEK AT S-42-511
B-051	P	FW	TYGER RIVER AT SC 72, 5.5 MI SW OF CARLISLE
B-777	BIO	FW	CANE CREEK AT SR 359
03050107-060			
B-321	P	FW	TRIBUTARY TO FAIRFOREST CREEK, 200 FEET BELOW S-42-65
B-020	S	FW	FAIRFOREST CREEK AT US 221, S OF SPARTANBURG
B-164	S	FW	FAIRFOREST CREEK AT S-42-651, 3.5 MI SSE OF SPARTANBURG
B-021	P/BIO	FW	FAIRFOREST CREEK AT SC 56
B-235	S	FW	KELSEY CREEK AT S-42-321
CL-035	W	FW	LAKE JOHNSON AT SPILLWAY AT S-42-359
CL-033	W	FW	LAKE CRAIG 45 METERS NW OF DAM
BF-007	S	FW	FAIRFOREST CREEK ON COUNTY ROAD 12, SW OF JONESVILLE
B-199	S	FW	MITCHELL CREEK AT COUNTY ROAD 233, 2.3 MI SSW OF JONESVILLE
B-781	BIO	FW	MITCHELL CREEK AT SR 19, 1ST REPLICATE OF 2 STA., DOWNSTREAM OF BRIDGE
B-779	BIO	FW	SUGAR CREEK AT SR 52
B-067A	S	FW	TOSCHS CREEK AT US 176, 2 MI SW OF UNION
B-067B	S	FW	TOSCHS CREEK AT ROAD TO TREATMENT PLANT OFF S-44-92, SW OF UNION

Station #	Type	Class	Description
BF-008	S/BIO	FW	FAIRFOREST CREEK AT S-44-16, SW OF UNION
B-286	S	FW	TINKER CREEK AT ROAD TO TREATMENT PLANT, 1.3 MI SSE OF UNION
B-287	S	FW	TINKER CREEK AT UNNUMBERED COUNTY ROAD, 1.7 MI SSE OF UNION
B-336	W/BIO	FW	TINKER CREEK AT S-44-278, 9 MI SSE OF UNION

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.net/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for
- W = Special watershed station added for the Broad River Basin study
- BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
		CR	Chromium (ug/l)
pH	pH (SU)	CU	Copper (ug/l)
TP	Total Phosphorus (mg/l)	PB	Lead (ug/l)
TN	Total Nitrogen (mg/l)	HG	Mercury (ug/l)
TURB	Turbidity (NTU)	NI	Nickel (ug/l)
TSS	Total Suspended Solids (mg/l)	ZN	Zinc (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)		

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1995 and December 1999.
For trends, number of surface samples collected between January 1984 and December 1999.
For total phosphorus, an additional trend period of January 1992 to December 1999 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1995 and December 1999. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units.

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1995 and December 1999.

Key to Trends:

D	Statistically significant decreasing trend in parameter concentration
I	Statistically significant increasing trend in parameter concentration
*	No statistically significant trend
Blank	Insufficient data to test for long-term trends

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (85 -99)						pH	pH	pH	MEAN	TRENDS (85-99)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050107010																				
B-317	P	MUSH CK	FW	58	0	0		*	172		D	168	-0.038	58	1	2	5.85	*	169	
B-741	BIO	S TYGER RVR	FW																	
CL-100	BD	LAKE ROBINSON	FW	9	0	0								9	2	22	8.57			
B-341	BD	LAKE CUNNINGHAM	FW	16	0	0								15	0	0				
B-149	S	S TYGER RVR	FW	29	0	0		D	77	-0.025	D	78	-0.05	28	1	4	5.75	D	76	-0.017
B-263	S	S TYGER RVR	FW	29	0	0		I	80	0.033	D	80	-0.025	28	0	0		D	78	-0.013
B-625	BIO	MAPLE CK	FW																	
B-005A	BIO	S TYGER RVR	FW																	
B-005	S	S TYGER RVR	FW	29	0	0		*	79		D	79	-0.02	28	0	0		D	77	-0.019
B-782	BIO	BENS CREEK	FW																	
B-332	BD/BIO	S TYGER RVR	FW	22	0	0								22	0	0				
B-787	BIO	FERGERSON CK	FW																	
03050107020																				
B-348	BD	LAKE COOLEY	FW	12	0	0								12	2	17	8.7			
B-315	S	N TYGER RVR TRIB	FW	21	1	5	4.7	*	71		D	71	-0.2	20	0	0		D	69	-0.056
B-219	P*	N TYGER RVR	FW	39	0	0		D	91	-0.031	*	90		38	1	3	5.95	D	89	-0.032
03050107030																				
B-017	BIO	N TYGER RVR	FW																	
B-018A	P*	N TYGER RVR	FW	40	0	0		D	38	-0.056	*	37		40	0	0		*	38	
03050107040																				
B-794	BIO	MIDDLE TYGER RVR	FW																	
B-148	P/BIO	MIDDLE TYGER RVR	FW	60	0	0		I	173	0.02	D	173	-0.031	60	1	2	5.8	*	169	
B-784	BIO	BEAVERDAM CK	FW																	
B-012	S	MIDDLE TYGER RVR	FW	29	0	0		I	78	0.026	D	78	-0.225	28	0	0		D	76	-0.089
B-014	BD/BIO	MIDDLE TYGER RVR	FW	22	0	0								21	0	0				
03050107050																				
B-008	P	TYGER RVR	FW	59	0	0		D	172	-0.024	D	173	-0.06	59	0	0		D	170	-0.043
B-019	S	JIMMIES CK	FW	30	0	0		*	79		*	79		30	0	0		D	79	-0.02
B-786	BIO	JIMMIES CK	FW																	
B-733	BIO	DUTCHMAN CK	FW																	
B-051	P	TYGER RVR	FW	53	0	0		*	165		D	160	-0.05	53	1	2	5.8	D	165	-0.02
B-777	BIO	CANE CK	FW																	

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050107010																		
B-317	P	MUSH CK	FW	*	78		D	157	-0.001	D	150	-0.016	*	170				
B-741	BIO	S TYGER RVR	FW															
CL-100	BD	LAKE ROBINSON	FW															
B-341	BD	LAKE CUNNINGHAM	FW															
B-149	S	S TYGER RVR	FW	*	32		*	73					D	76	-0.086			
B-263	S	S TYGER RVR	FW	I	36	0.007	D	76	-0.003				I	77	-0.224			
B-625	BIO	MAPLE CK	FW															
B-005A	BIO	S TYGER RVR	FW															
B-005	S	S TYGER RVR	FW	I	36	0.01	D	77	-0.005				I	76	0.417			
B-782	BIO	BENS CREEK	FW															
B-332	BD/BIO	S TYGER RVR	FW															
B-787	BIO	FERGERSON CK	FW															
03050107020																		
B-348	BD	LAKE COOLEY	FW															
B-315	S	N TYGER RVR TRIB	FW				D	70	-0.05				*	69	"			
B-219	P*	N TYGER RVR	FW	*	46		*	87					I	88	0.8			
03050107030																		
B-017	BIO	N TYGER RVR	FW															
B-018A	P*	N TYGER RVR	FW	I	37	0.017	I	37	0.03				*	37				
03050107040																		
B-794	BIO	MIDDLE TYGER RVR	FW															
B-148	P/BIO	MIDDLE TYGER RVR	FW	D	84	0.0	D	165	0.0	*	148		I	173	0.4			
B-784	BIO	BEAVERDAM CK	FW															
B-012	S	MIDDLE TYGER RVR	FW	*	34		*	74					*	75				
B-014	BD/BIO	MIDDLE TYGER RVR	FW															
03050107050																		
B-008	P	TYGER RVR	FW	*	84		*	164		D	159	-0.023	I	171	0.5			
B-019	S	JIMMIES CK	FW	I	35	0.01	D	77	-0.002				*	77				
B-786	BIO	JIMMIES CK	FW															
B-733	BIO	DUTCHMAN CK	FW															
B-051	P	TYGER RVR	FW	*	75		*	153		D	148	-0.017	I	164	0.669	*	30	
B-777	BIO	CANE CK	FW															

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050107010																	
B-317	P	MUSH CK	FW	216	58	16	28	834	*	171		57	0	20	0	10	0
B-741	BIO	S TYGER RVR	FW														
CL-100	BD	LAKE ROBINSON	FW	5	6	0	0					5	0	2	0	10	0
B-341	BD	LAKE CUNNINGHAM	FW	38	12	1	8	490				10	0				
B-149	S	S TYGER RVR	FW	56	29	2	7	550	*	76							
B-263	S	S TYGER RVR	FW	172	29	5	17	958	*	79							
B-625	BIO	MAPLE CK	FW														
B-005A	BIO	S TYGER RVR	FW														
B-005	S	S TYGER RVR	FW	376	29	11	38	1,218	I	78	9.199						
B-782	BIO	BENS CREEK	FW														
B-332	BD/BIO	S TYGER RVR	FW	260	22	4	18	1,770				21	0	8	0	10	0
B-787	BIO	FERGERSON CK	FW														
03050107020																	
B-348	BD	LAKE COOLEY	FW	9	10	0	0					10	0				
B-315	S	N TYGER RVR TRIB	FW	521	21	15	71	868	*	70							
B-219	P*	N TYGER RVR	FW	291	39	12	31	762	*	90		20	0	8	0	10	0
03050107030																	
B-017	BIO	N TYGER RVR	FW														
B-018A	P*	N TYGER RVR	FW	884	40	23	58	2,664	*	38		22	0	8	0	10	0
03050107040																	
B-794	BIO	MIDDLE TYGER RVR	FW														
B-148	P/BIO	MIDDLE TYGER RVR	FW	299	59	24	41	1,087	I	171	11.2	58	0	19	0	10	0
B-784	BIO	BEAVERDAM CK	FW														
B-012	S	MIDDLE TYGER RVR	FW	322	28	10	36	972	*	76							
B-014	BD/BIO	MIDDLE TYGER RVR	FW	557	22	9	41	997				22	0	8	0	10	0
03050107050																	
B-008	P	TYGER RVR	FW	412	59	23	39	1,047	*	173		59	0	20	0	10	0
B-019	S	JIMMIES CK	FW	1,223	30	23	77	15,084	I	79	37.5						
B-786	BIO	JIMMIES CK	FW														
B-733	BIO	DUTCHMAN CK	FW														
B-051	P	TYGER RVR	FW	336	53	23	43	1,564	D	163	13.3	53	0	16	0	10	0
B-777	BIO	CANE CK	FW														

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050107010																								
B-317	P	MUSH CK	FW	20	0	10	0	20	0	0	20	0	0	20	0	0.2	0	20	0	20	0	20	1	5
B-741	BIO	S TYGER RVR	FW																					
CL-100	BD	LAKE ROBINSON	FW	2	0	10	0	2	0	0	2	0	0	2	0	0.2	0	2	0	20	0	2	0	0
B-341	BD	LAKE CUNNINGHAM	FW																					
B-149	S	S TYGER RVR	FW																					
B-263	S	S TYGER RVR	FW																					
B-625	BIO	MAPLE CK	FW																					
B-005A	BIO	S TYGER RVR	FW																					
B-005	S	S TYGER RVR	FW																					
B-782	BIO	BENS CREEK	FW																					
B-332	BD/BIO	S TYGER RVR	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	2	25
B-787	BIO	FERGERSON CK	FW																					
03050107020																								
B-348	BD	LAKE COOLEY	FW																					
B-315	S	N TYGER RVR TRIB	FW																					
B-219	P*	N TYGER RVR	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	2	25
03050107030																								
B-017	BIO	N TYGER RVR	FW																					
B-018A	P*	N TYGER RVR	FW	8	0	10	0	8	1	13	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
03050107040																								
B-794	BIO	MIDDLE TYGER RVR	FW																					
B-148	P/BIO	MIDDLE TYGER RVR	FW	19	0	10	0	19	1	5	19	0	0	19	0	0.2	0	19	0	20	0	19	1	5
B-784	BIO	BEAVERDAM CK	FW																					
B-012	S	MIDDLE TYGER RVR	FW																					
B-014	BD/BIO	MIDDLE TYGER RVR	FW	8	0	10	0	8	1	13	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
03050107050																								
B-008	P	TYGER RVR	FW	20	1	10	5	20	0	0	20	0	0	20	0	0.2	0	20	0	20	0	20	1	5
B-019	S	JIMMIES CK	FW																					
B-786	BIO	JIMMIES CK	FW																					
B-733	BIO	DUTCHMAN CK	FW																					
B-051	P	TYGER RVR	FW	16	1	10	6.3	16	1	6	16	1	6	16	0	0.2	0	16	0	20	0	16	1	6
B-777	BIO	CANE CK	FW																					

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050107060																				
B-321	P	FAIRFOREST CK TRIB	FW	59	5	8	4.34	*	171		D	171	-0.289	59	6	10	5.667	D	168	-0.06
B-020	S	FAIRFOREST CK	FW	30	0	0		*	80		D	80	-0.067	28	0	0		*	77	
B-164	S	FAIRFOREST CK	FW	29	0	0		*	79		*	78		29	1	3	8.9	*	78	
B-021	P/BIO	FAIRFOREST CK	FW	60	0	0		*	173		D	174	-0.077	60	1	2	8.95	*	171	
B-235	S	KELSEY CK	FW	30	0	0		D	79	-0.05	D	79	-0.038	29	0	0		D	78	-0.04
CL-035	BD	LAKE JOHNSON	FW	10	1	10	2.6							10	7	70	9.161			
CL-033	BD	LAKE CRAIG	FW	10	1	10	4.1							8	2	25	7.1			
BF-007	S	FAIRFOREST CK	FW	22	0	0		*	75		*	73		22	0	0		*	76	
B-199	S	MITCHELL CK	FW	23	0	0		*	77		D	75	-0.05	23	0	0		*	77	
B-781	BIO	MITCHELL CK	FW																	
B-779	BIO	SUGAR CK	FW																	
B-067A	S	TOSCHS CK	FW	23	0	0		*	73		D	71	-0.037	23	0	0		D	73	-0.025
B-067B	S	TOSCHS CK	FW	24	0	0		*	74		D	71	-0.07	24	0	0		D	74	-0.017
BF-008	P*/BIO	FAIRFOREST CK	FW	33	0	0		*	87		D	85	-0.042	33	0	0		D	87	-0.033
B-286	S	TINKER CK	FW	23	0	0		*	75		D	71	-0.067	23	0	0		D	75	-0.02
B-287	S	TINKER CK	FW	22	0	0		*	76		D	72	-0.078	22	0	0		*	76	
B-336	BD/BIO	TINKER CK	FW	20	0	0								20	0	0				

TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS (92-99)			TRENDS (85-99)											
				TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050107060																		
B-321	P	FAIRFOREST CK TRIB	FW	*	87		D	166	-0.03	D	146	-1.453	*	171				
B-020	S	FAIRFOREST CK	FW	*	34		D	74	-0.005				*	77				
B-164	S	FAIRFOREST CK	FW	I	35	0.194	*	75					*	76				
B-021	P/BIO	FAIRFOREST CK	FW	*	85		D	164	-0.015	D	162	-0.086	*	171				
B-235	S	KELSEY CK	FW	*	36		*	77					*	76				
CL-035	BD	LAKE JOHNSON	FW															
CL-033	BD	LAKE CRAIG	FW															
BF-007	S	FAIRFOREST CK	FW	*	34		*	69					*	75				
B-199	S	MITCHELL CK	FW	*	36		D	73	-0.007				D	77	-0.5			
B-781	BIO	MITCHELL CK	FW															
B-779	BIO	SUGAR CK	FW															
B-067A	S	TOSCHS CK	FW	D	33	-0.195	D	67	-0.085				D	72	-0.535			
B-067B	S	TOSCHS CK	FW	*	33		D	68	-0.001				*	73				
BF-008	P*/BIO	FAIRFOREST CK	FW	I	44	0.015	*	82					*	88				
B-286	S	TINKER CK	FW	I	35	0.003	*	70					D	75	-0.443			
B-287	S	TINKER CK	FW	*	34		D	71	-0.023				*	74				
B-336	BD/BIO	TINKER CK	FW															

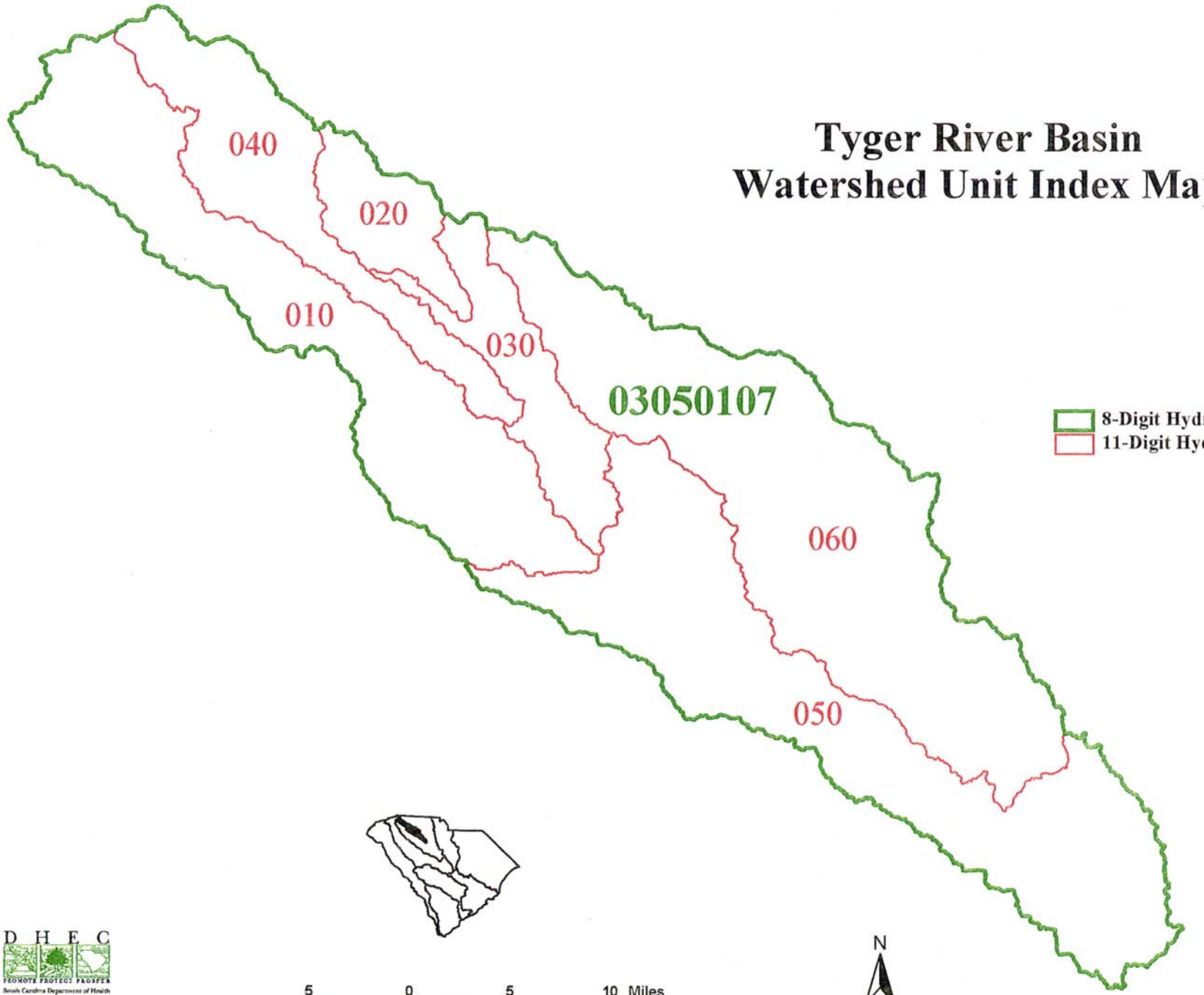
TYGER RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050107060																	
B-321	P	FAIRFOREST CK TRIB	FW	288	59	25	42	4,185	I	172	7.8	56	1	21	0	10	0
B-020	S	FAIRFOREST CK	FW	7,236	29	29	100	150,566	I	78	137.5						
B-164	S	FAIRFOREST CK	FW	823	29	17	59	4,259	I	79	39.2						
B-021	P/BIO	FAIRFOREST CK	FW	759	60	33	55	15,472	I	174	22.5	59	0	19	0	10	0
B-235	S	KELSEY CK	FW	508	30	12	40	1,968	*	78							
CL-035	BD	LAKE JOHNSON	FW	6	6	0	0					6	0				
CL-033	BD	LAKE CRAIG	FW	3	6	0	0					6	0				
BF-007	S	FAIRFOREST CK	FW	393	22	7	32	2,787	*	76							
B-199	S	MITCHELL CK	FW	576	23	14	61	1,527	I	76	21.9						
B-781	BIO	MITCHELL CK	FW														
B-779	BIO	SUGAR CK	FW														
B-067A	S	TOSCHS CK	FW	283	23	7	30	733	*	73							
B-067B	S	TOSCHS CK	FW	456	24	14	58	1,331	*	74							
BF-008	P*/BIO	FAIRFOREST CK	FW	343	34	12	35	1,899	*	88		21	0	7	0	10	0
B-286	S	TINKER CK	FW	411	23	12	52	1,273	D		-16.7						
B-287	S	TINKER CK	FW	519	22	12	55	1,342	*	76							
B-336	BD/BIO	TINKER CK	FW	375	20	13	65	916				20	0	7	0	10	0

TYGER RIVER BASIN WATER QUALITY SUMMARY

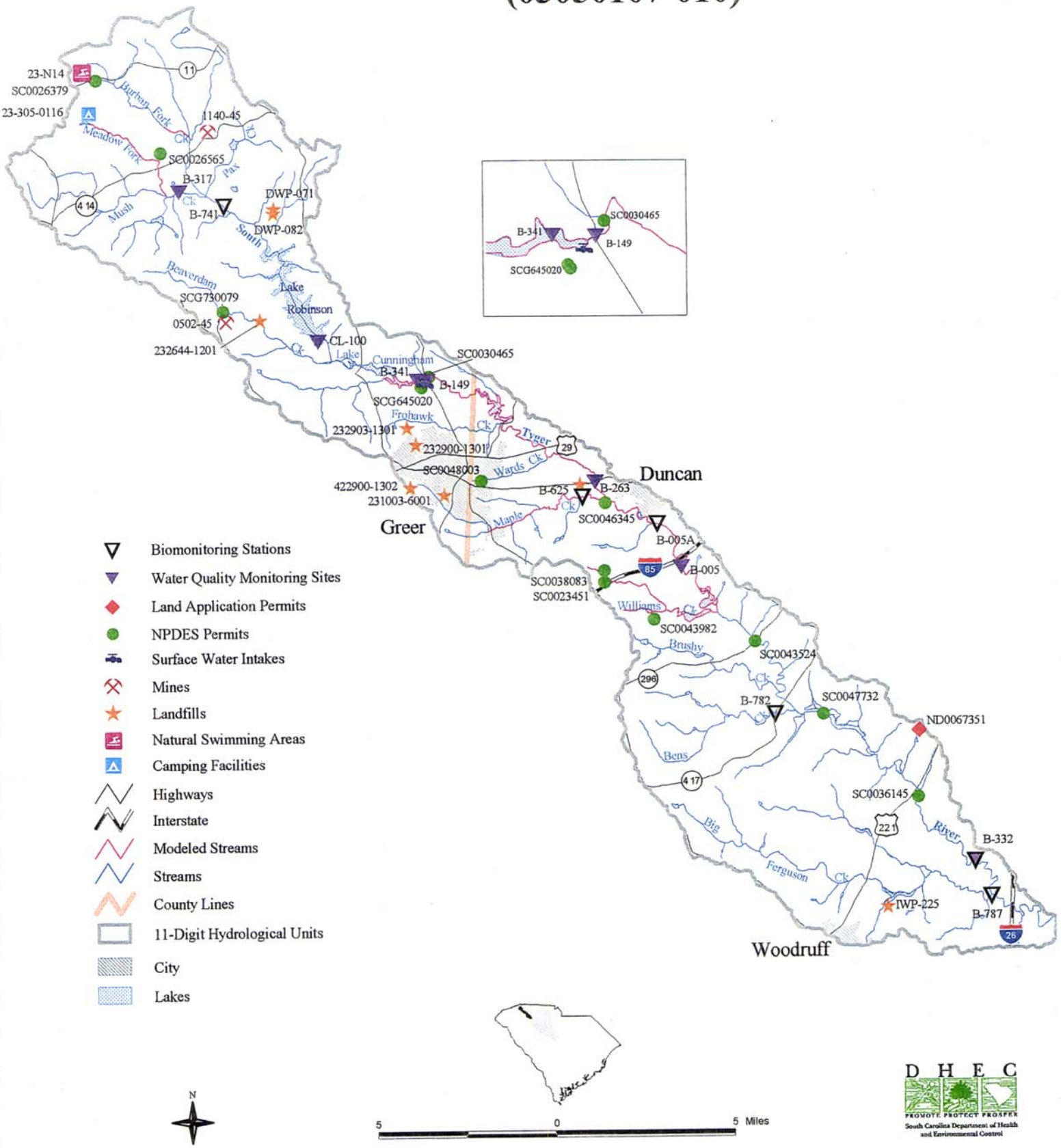
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050107060																								
B-321	P	FAIRFOREST CK TRIB	FW	21	4	10	19	21	2	10	21	0	0	20	0	0.2	0	21	0	20	0	21	8	38
B-020	S	FAIRFOREST CK	FW																					
B-164	S	FAIRFOREST CK	FW																					
B-021	P/BIO	FAIRFOREST CK	FW	19	3	10	16	19	3	16	19	0	0	19	0	0.2	0	19	0	20	0	19	2	11
B-235	S	KELSEY CK	FW																					
CL-035	BD	LAKE JOHNSON	FW																					
CL-033	BD	LAKE CRAIG	FW																					
BF-007	S	FAIRFOREST CK	FW																					
B-199	S	MITCHELL CK	FW																					
B-781	BIO	MITCHELL CK	FW																					
B-779	BIO	SUGAR CK	FW																					
B-067A	S	TOSCHS CK	FW																					
B-067B	S	TOSCHS CK	FW																					
BF-008	P*/BIO	FAIRFOREST CK	FW	7	0	10	0	7	1	14	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
B-286	S	TINKER CK	FW																					
B-287	S	TINKER CK	FW																					
B-336	BD/BIO	TINKER CK	FW	7	0	10	0	7	2	29	7	0	0	7	0	0.2	0	7	0	20	0	7	1	14

Tyger River Basin
Watershed Unit Index Map

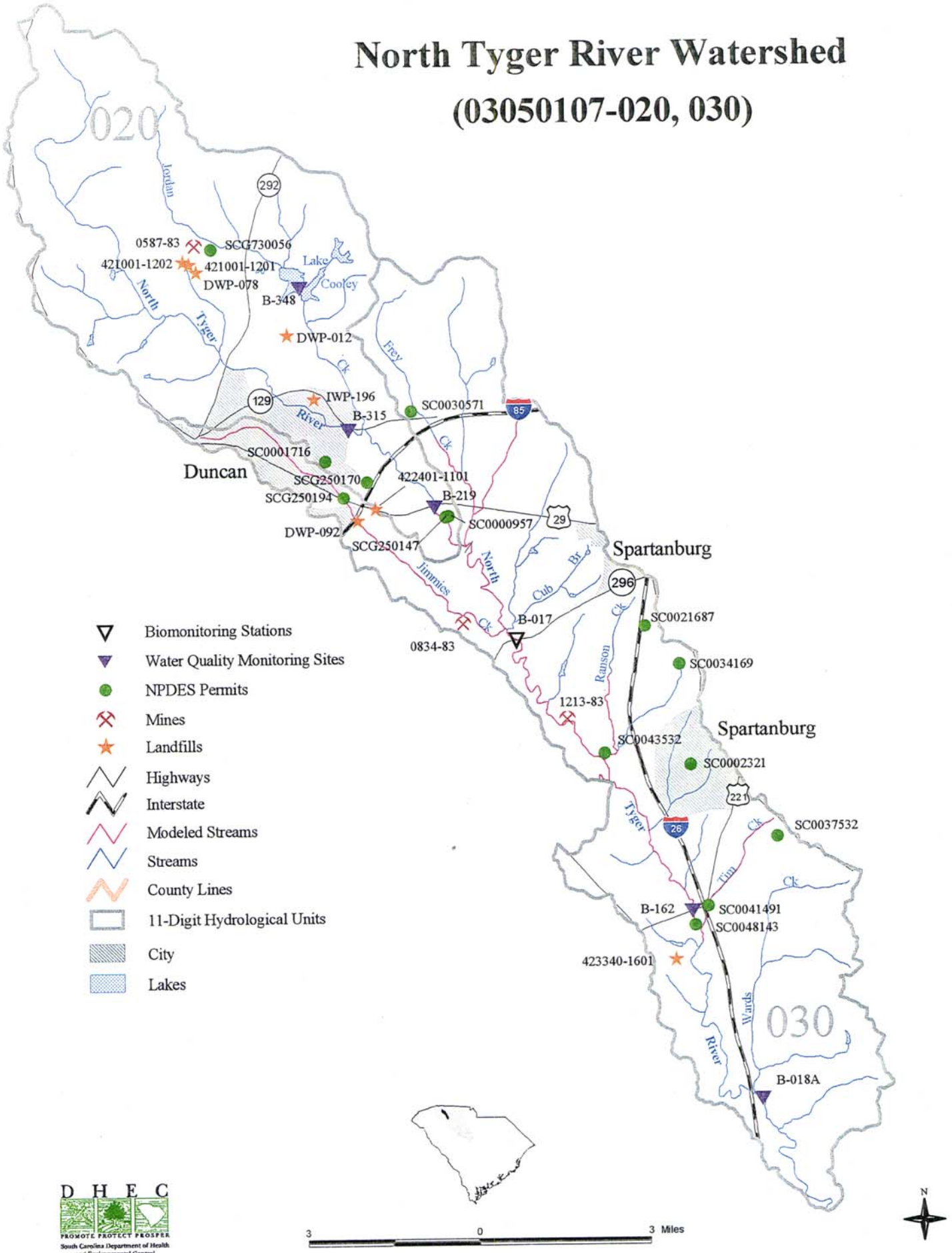


D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

South Tyger River Watershed
(03050107-010)

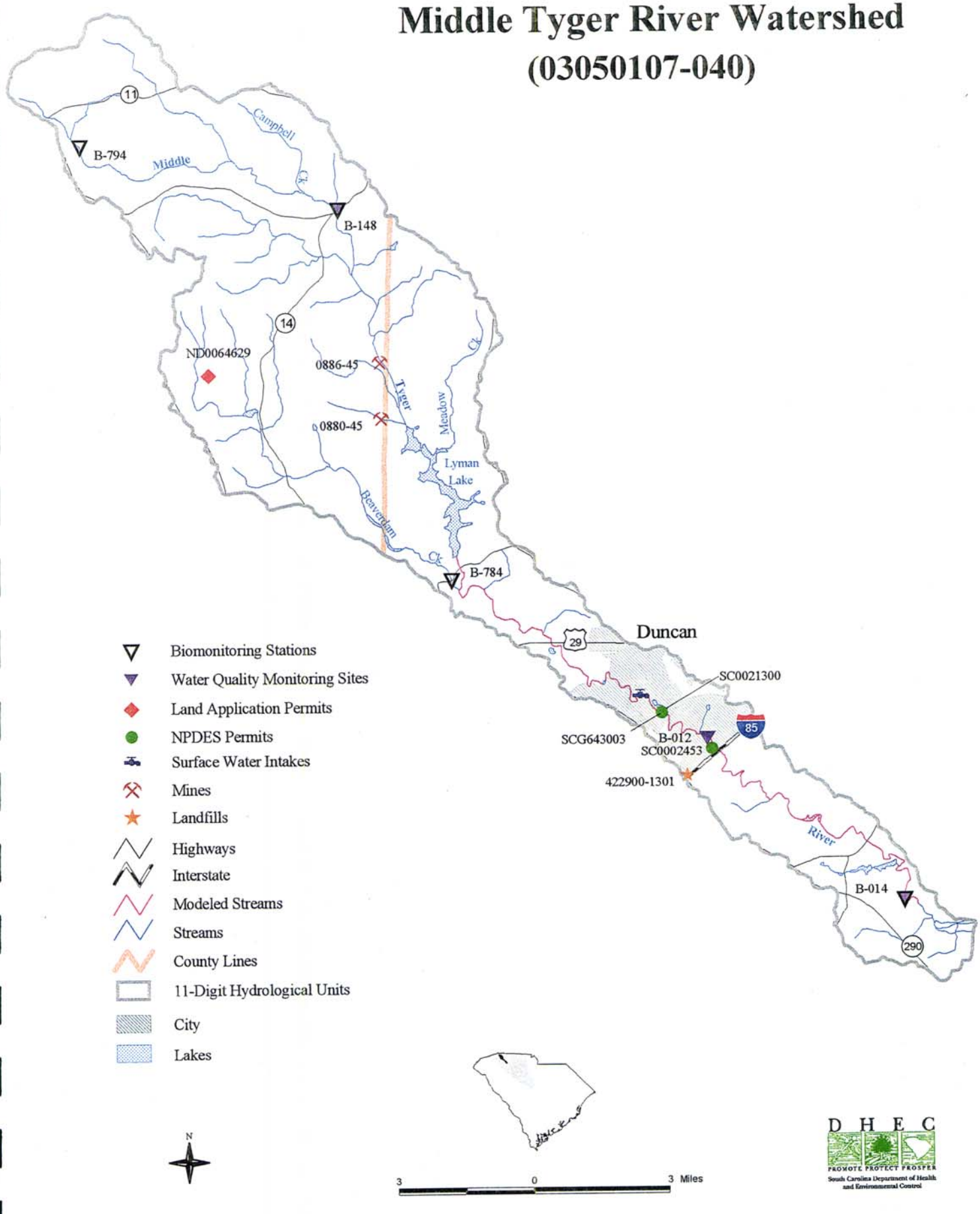


North Tyger River Watershed
(03050107-020, 030)



D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Middle Tyger River Watershed
(03050107-040)



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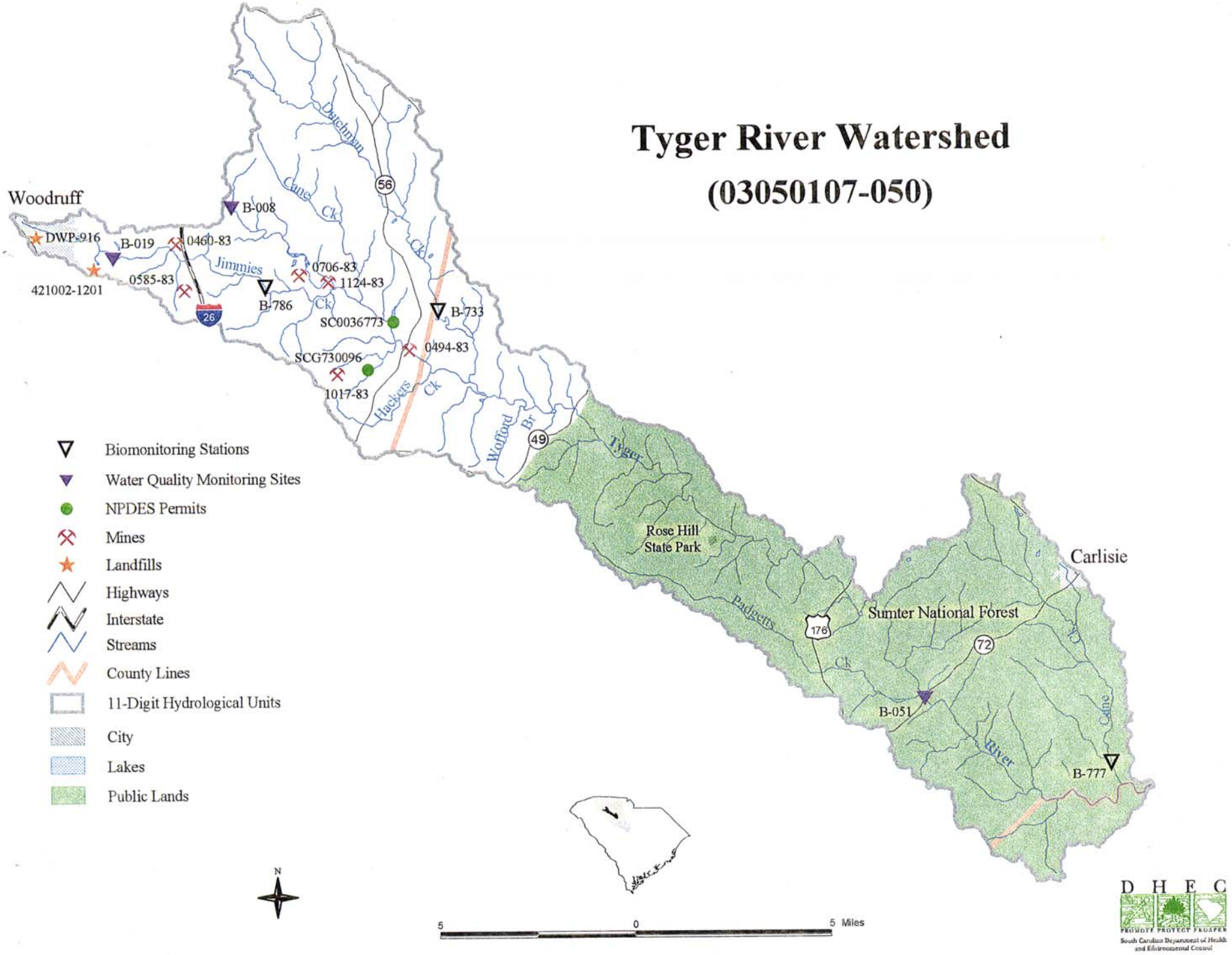
PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control


Tyger River Watershed
(03050107-050)
Woodruff
Carlisie
Rose Hill
State Park
Sumter National Forest
Tyger
Jimmies
Cane Ck
Dutchman
Hackers Ck
Wofford Br
Padgetts Ck
Cane River
DWP-916
B-019
0460-83
0585-83
421002-1201
B-008
0706-83
1124-83
B-786
SC0036773
B-733
0494-83
SCG730096
1017-83
B-051
B-777
26
56
49
176
72
Biomonitoring Stations
Water Quality Monitoring Sites
NPDES Permits
Mines
Landfills
Highways
Interstate
Streams
County Lines
11-Digit Hydrological Units
City
Lakes
Public Lands
N
5
0
5 Miles
D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Fairforest Creek Watershed
(03050107-060)

APPENDIX C.

Broad River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03050105-050			
B-296	BIO	FW	SUCK CREEK AT WALTER RD OFF SR 29 NEAR NC STATE LINE
03050105-090			
B-789	BIO	FW	ROSS CREEK AT SR 577
B-788	BIO	FW	BOWEN RIVER AT SR 83
B-042	P	FW	BROAD RIVER AT SC 18, 4 MI NE GAFFNEY
B-088	S	FW	CANOE CREEK AT S-11-245, ½ MI W OF BLACKSBURG
B-211	S	FW	PEOPLES CREEK AT UNIMPROVED ROAD, 2.3 MI E OF GAFFNEY
B-100	S	FW	FURNACE CREEK AT S-11-50, 6 MI E OF GAFFNEY
B-323	S	FW	DOOLITTLE CREEK AT S-11-100, 1.25 MI SE OF BLACKSBURG
B-343	W	FW	LAKE CHEROKEE IN FOREBAY NEAR DAM
B-330	S	FW	GUYONMOORE CREEK AT S-46-233
B-044	P	FW	BROAD RIVER AT SC 211, 12 MI SE OF GAFFNEY
03050105-100			
B-740	BIO	FW	BUFFALO CREEK AT SC 198
B-119	S	FW	BUFFALO CREEK AT S-11-213, 2.2 MI NNW OF BLACKSBURG
B-057	S	FW	BUFFALO CREEK AT SC 5, 1 MI W OF BLACKSBURG
03050105-110			
B-056	S	FW	CHEROKEE CREEK AT US 29, 3 MI E OF GAFFNEY
B-679	BIO	FW	CHEROKEE CREEK AT SC 329
03050105-120			
B-333	W/BIO	FW	KINGS CREEK AT S-11-209, 3 MI W OF SMYRNA
03050105-130			
B-342	W	FW	LAKE THICKETTY IN FOREBAY NEAR DAM
B-059	S	FW	IRENE CREEK AT S-11-307, 2.5 MI W OF GAFFNEY
B-095	S	FW	THICKETTY CREEK AT S-11-164
B-128	S	FW	LIMESTONE CREEK AT S-11-301
B-133	S/BIO	FW	THICKETTY CREEK AT SC 18, 8.3 MI S OF GAFFNEY
B-334	W/BIO	FW	GILKEY CREEK AT S-11-231, 9 MI SE OF GAFFNEY
B-062	S	FW	THICKETTY CREEK AT SC 211, 2 MI ABOVE JUNCTION WITH BROAD RIVER
03050105-140			
B-739	BIO	FW	BULLOCK CREEK AT S-46-40
B-325	S	FW	CLARK FORK INTO CRAWFORD LAKE ON ROAD NEAR SC 161 & 705
B-737	W	FW	LAKE YORK IN KINGS MOUNTAIN STATE PARK
B-326	S	FW	LONG BRANCH ON SC 216, BELOW KINGS MTN PARK RECREATION AREA
B-157	BIO	FW	CLARK FORK AT S-46-63
B-159	S	FW	BULLOCK CREEK AT SC 97, 4.8 MI S OF HICKORY GROVE
03050105-150			
B-099-7	BIO	ORW	VAUGHN CREEK AT UNNUMBERED ROAD, 0.4 MI S OF S-23-319
B-099A	S	FW	LAKE LANIER ON # 1 INLET IN GREENVILLE COUNTY
B-099B	S	FW	LAKE LANIER AT DAM IN GREENVILLE COUNTY
B-719	BIO	FW	NORTH PACOLET RIVER AT S-42-128
B-301	S	FW	PAGE CREEK AT S-42-1258, 1.7 MI SE LANDRUM
B-026	P	FW	NORTH PACOLET RIVER AT S-42-956, 6.5 MI E LANDRUM
B-126	W	FW	NORTH PACOLET RIVER AT S-42-978, 1 MI SE OF FINGERVILLE

Station #	Type	Class	Description
03050105-150			
B-791	BIO	FW	OBED CREEK AT SR 42
03050105-160			
B-720	BIO	FW	SOUTH PACOLET RIVER AT S-42-183
B-103	S	FW	SPIVEY CREEK AT S-42-208, 2.5 MI SSE OF LANDRUM
B-104	BIO	FW	SPIVEY CREEK AT SR 209
B-790	BIO	FW	MOTLOW CREEK AT SR 888
B-302	S	FW	SOUTH PACOLET RIVER AT S-42-866, 1 MI SE CAMPOBELLO
B-340	W	FW	LAKE BOWEN NEAR HEADWATERS, 0.4 KM W OF S-42-37
B-339	W	FW	LAKE BOWEN IN FOREBAY NEAR DAM
B-113	S	FW	SPARTANBURG RESERVOIR #1 ON S-42-213 NE OF INMAN
03050105-170			
B-028	S	FW	PACOLET RIVER AT S-42-55, BELOW CONFL OF N. & S. PACOLET RIVERS
B-783	BIO	FW	BUCK CREEK AT PEACH SHED RD.
B-259	S	FW	LITTLE BUCK CREEK AT UNNUMBERED COUNTY ROAD, 2.3 MI SW OF CHESNEE
B-347	W	FW	LAKE BLALOCK IN FOREBAY NEAR DAM
B-163A	S	FW	PACOLET RIVER AT BRIDGE ON S-42-737, 2.9 MI NW OF COWPENS
B-191	S	FW	POTTER BRANCH ON ROAD 30, BELOW OUTFALL FROM HOUSING PROJECT
B-331	W	FW	PACOLET RIVER AT S-42-59, BEACON LIGHT ROAD IN CLIFTON
03050105-180			
B-221	S/BIO	FW	LAWSONS FORK CREEK AT S-42-40, BELOW INMAN MILL EFFLUENT
B-277	S	FW	LAWSONS FORK CREEK AT S-42-218, 2.7 MI SSE OF INMAN
B-278	S	FW	LAWSONS FORK CREEK AT UNNUMBERED ROAD BELOW MILLIKEN CHEMICAL
B-531	BIO	FW	MEADOW CREEK AT SR 56
BL-005	S	FW	LAWSONS FORK CREEK AT S-42-79 AT VALLEY FALLS
BL-001	P/BIO	FW	LAWSONS FORK CREEK AT S-42-108
03050105-190			
BP-001	S	FW	PACOLET RIVER ABOVE DAM AT PACOLET MILLS
B-780	BIO	FW	MILL CREEK AT SR 73
B-048	P	FW	PACOLET RIVER AT SC 105, 6 MI ABOVE CONFLUENCE WITH BROAD RIVER
03050106-010			
B-344	W	FW	LAKE JOHN D. LONG IN FOREBAY NEAR DAM
B-778	BIO	FW	NEALS CREEK AT SR 86
B-046	P	FW	BROAD RIVER AT SC 72/215/121, 3 MI E OF CARLISLE
03050106-020			
B-086	S	FW	ROSS BRANCH AT SC 49, SW OF YORK
B-136	W/BIO	FW	TURKEY CREEK AT SC 9, 14 MI NW OF CHESTER
03050106-030			
B-064	S	FW	MENG CREEK AT SC 49, 2.5 MI E OF UNION
B-243	S	FW	TRIBUTARY TO MENG CREEK AT CULVERT ON S-44-384, 3 MI E OF UNION
B-155	W/BIO	FW	BROWNS CREEK AT S-44-86, 8 MI E OF UNION
B-335	W	FW	GREGORYS CREEK AT S-44-86, 8 MI E OF UNION
03050106-040			
CL-023	W	FW	CHESTER STATE PARK LAKE, 100 M E OF SPILLWAY
B-074	S	FW	DRY FORK AT S-12-304, 2 MI SW OF CHESTER
B-075	S/BIO	FW	SANDY RIVER AT SC 215, 2.5 MI ABOVE CONFLUENCE WITH BROAD RIVER

Station #	Type	Class	Description
03050106-050			
B-047	S	FW	BROAD RIVER AT SC 34, 14 MI NE OF NEWBERRY
B-151	BIO	FW	HELLERS CREEK AT SR 97
B-346	W	FW	PARR RESERVOIR 4.8 KM N OF DAM, UPSTREAM OF MONTICELLO RESERVOIR
B-751	BIO	FW	CANNONS CREEK AT US 176
B-328	P	FW	MONTICELLO RESERVOIR, UPPER IMPOUNDMENT AT BUOY MIDDLE OF LAKE
B-327	P	FW	MONTICELLO RESERVOIR, LOWER IMPOUNDMENT BETWEEN LARGE ISLANDS
B-345	W	FW	PARR RESERVOIR IN FOREBAY NEAR DAM
03050106-060			
B-800	BIO	FW	CRIMS CREEK AT SR 213
B-801	BIO	FW	WATEREE CREEK AT SR 698
B-236	P	FW	BROAD RIVER AT SC 213, 2.5 MI SW OF JENKINSVILLE
B-110	S	FW	LAKE AT SPILLWAY ON US 21
B-081	BIO	FW	CRANE CREEK AT US 321
B-316	P	FW	CRANE CREEK AT S-40-43 UNDER I-20, NORTH COLUMBIA
B-280	P/BIO	FW	SMITH BRANCH AT N MAIN ST (US 21) IN COLUMBIA
B-337	W	FW	BROAD RIVER AT US 176 (BROAD RIVER ROAD) IN COLUMBIA
B-080	P	FW	BROAD RIVER DIVERSION CANAL AT COLUMBIA WATER PLANT
03050106-070			
B-145	S/BIO	FW	LITTLE RIVER AT S-20-60, 3.1 MI SW OF JENKINSVILLE
03050106-080			
B-123	S	FW	WINNSBORO BRANCH AT US 321, ABOVE WINNSBORO MILLS OUTFALL
B-077	S	FW	WINNSBORO BRANCH BELOW PLANT OUTFALL
B-102	W/BIO	FW	JACKSON CREEK AT S-20-54, 5 MI W OF WINNSBORO
B-338	W	FW	MILL CREEK AT S-20-48, 10 MI SW OF WINNSBORO
03050106-090			
B-320	W/BIO	FW	BIG CEDAR CREEK AT SC 215

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.net/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for
- W = Special watershed station added for the Broad River Basin study
- BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1995 and December 1999.
For trends, number of surface samples collected between January 1984 and December 1999.
For total phosphorus, an additional trend period of January 1992 to December 1999 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1995 and December 1999. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1995 and December 1999.

Key to Trends:

D	Statistically significant decreasing trend in parameter concentration
I	Statistically significant increasing trend in parameter concentration
*	No statistically significant trend
Blank	Insufficient data to test for long-term trends

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050105050																				
B-296	BIO	SUCK CK	FW																	
03050105090																				
B-789	BIO	ROSS CK	FW																	
B-788	BIO	BOWEN RVR	FW																	
B-042	P	BROAD RVR	FW	52	0	0		I	167	0.043	D	164	-0.019	52	0	0		*	167	
B-088	S	CANOE CK	FW	23	5	22	4	*	75		*	73		23	0	0		D	75	-0.019
B-211	S	PEOPLES CK	FW	23	0	0		*	76		*	74		23	0	0		D	76	-0.033
B-100	P*	FURNACE CK	FW	32	0	0		*	87		D	83	-0.076	32	0	0		*	87	
B-323	S	DOOLITTLE CK	FW	23	0	0		D	75	-0.059	D	73	-0.05	23	0	0		D	75	-0.025
B-343	BD	LAKE CHEROKEE	FW	7	0	0								7	0	0				
B-330	S	GUYONMOORE CK	FW	23	1	4	0.8	*	49		*	47		23	0	0		*	49	
B-044	P	BROAD RVR	FW	52	0	0		I	166	0.033	D	163	-0.029	52	0	0		*	166	
03050105100																				
B-740	BIO	BUFFALO CK	FW																	
B-119	S	BUFFALO CK	FW	22	0	0		I	81	0.1	D	78	-0.079	22	0	0		*	81	
B-057	P*	BUFFALO CK	FW	32	0	0		I	93	0.1	D	91	-0.05	32	0	0		*	93	
03050105110																				
B-056	P*	CHEROKEE CK	FW	32	1	3	0.4	*	86		*	84		32	0	0		D	87	-0.017
B-679	BIO	CHEROKEE CK	FW																	
03050105120																				
B-333	BD/BIO	KINGS CK	FW	19	1	5	2.8							19	0	0				
03050105130																				
B-342	BD	LAKE THICKETTY	FW	13	0	0								11	0	0				
B-059	S	IRENE CK	FW	23	0	0		*	76		*	74		23	0	0		D	76	-0.017
B-095	S	THICKETTY CK	FW	23	0	0		*	49		*	48		23	0	0		D	49	-0.033
B-128	S	LIMESTONE CK	FW	24	0	0		*	76		D	74	-0.033	24	0	0		D	76	-0.039
B-133	S/BIO	THICKETTY CK	FW	23	0	0		*	76		D	74	-0.05	23	0	0		D	76	-0.02
B-334	BD/BIO	GILKEY CK	FW	19	0	0								19	0	0				
B-062	P*/BIO	THICKETTY CK	FW	31	0	0		*	87		D	85	-0.029	31	0	0		*	87	
03050105140																				
B-739	BIO	BULLOCK CK	FW																	
B-325	S	CLARK FORK	FW	24	1	4	3	*	75		D	74	-0.057	23	0	0		D	74	-0.04
B-737	BD	LAKE YORK	FW	9	0	0								7	0	0				
B-326	S	LONG BRANCH	FW	24	0	0		*	79		D	75	-0.05	24	0	0		*	79	
B-157	BIO	CLARK FORK	FW																	
B-159	P*	BULLOCK CK	FW	32	0	0		*	87		*	85		32	1	3	5.9	*	87	

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050105050																		
B-296	BIO	SUCK CK	FW															
03050105090																		
B-789	BIO	ROSS CK	FW															
B-788	BIO	BOWEN RVR	FW															
B-042	P	BROAD RVR	FW	*	76		D	154	-0.002	D	147	-0.007	I	164	0.437			
B-088	S	CANOE CK	FW	*	34		D	73	-0.115				*	74				
B-211	S	PEOPLES CK	FW	*	32		D	70	-0.001				*	75				
B-100	P*	FURNACE CK	FW	D	41	-0.054	D	79	-0.039				D	85	-0.55			
B-323	S	DOOLITTLE CK	FW	*	34		D	67	-0.001				*	74				
B-343	BD	LAKE CHEROKEE	FW															
B-330	S	GUYONMOORE CK	FW	*	35		*	46					*	49				
B-044	P	BROAD RVR	FW	*	78		I	154	0.001	D	151	-0.006	I	165	0.488			
03050105100																		
B-740	BIO	BUFFALO CK	FW															
B-119	S	BUFFALO CK	FW	D	33	-0.092	D	77	-0.017	*	51		*	80		*	40	
B-057	P*	BUFFALO CK	FW	D	42	-0.095	D	88	-0.019	*	62		*	91		*	45	
03050105110																		
B-056	P*	CHEROKEE CK	FW	D	42	-0.032	*	80					D	84	-0.7			
B-679	BIO	CHEROKEE CK	FW															
03050105120																		
B-333	BD/BIO	KINGS CK	FW															
03050105130																		
B-342	BD	LAKE THICKETTY	FW															
B-059	S	IRENE CK	FW	*	34		*	72					D	73	-0.244			
B-095	S	THICKETTY CK	FW	*	36		*	47					*	49				
B-128	S	LIMESTONE CK	FW	*	36		*	74					*	75				
B-133	S/BIO	THICKETTY CK	FW	D	36	-0.014	*	75					D	75	-0.62			
B-334	BD/BIO	GILKEY CK	FW															
B-062	P*/BIO	THICKETTY CK	FW	*	47		*	82					D	85	-0.593			
03050105140																		
B-739	BIO	BULLOCK CK	FW															
B-325	S	CLARK FORK	FW	*	33		D	70	0.0				D	74	-0.418			
B-737	BD	LAKE YORK	FW															
B-326	S	LONG BRANCH	FW	I	33	0.002	*	71					D	75	-0.113			
B-157	BIO	CLARK FORK	FW															
B-159	P*	BULLOCK CK	FW	*	46		*	82					*	86				

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050105050																	
B-296	BIO	SUCK CK	FW														
03050105090																	
B-789	BIO	ROSS CK	FW														
B-788	BIO	BOWEN RVR	FW														
B-042	P	BROAD RVR	FW	275	52	16	31	2,958	*	166		52	0	16	0	10	0
B-088	S	CANOE CK	FW	465	23	12	52	1,914	*	75							
B-211	S	PEOPLES CK	FW	1,164	23	19	83	2,245	D	76	-106.7	2	0	1	0	10	0
B-100	P*	FURNACE CK	FW	341	32	14	44	1,379	D	86	-25.8	20	0	9	0	10	0
B-323	S	DOOLITTLE CK	FW	804	23	16	70	1,914	I	75	35.4	1	0				
B-343	BD	LAKE CHEROKEE	FW		7	0	0					7	0				
B-330	S	GUYONMOORE CK	FW	152	23	4	17	2,280	*	49							
B-044	P	BROAD RVR	FW	168	52	17	33	1,910	*	166		54	0	16	0	10	0
03050105100																	
B-740	BIO	BUFFALO CK	FW														
B-119	S	BUFFALO CK	FW	771	22	14	64	2,449	I	80	37.8	23	0	24	0	10	0
B-057	P*	BUFFALO CK	FW	549	32	14	44	2,361	I	94	21.3	33	0	33	1	10	3
03050105110																	
B-056	P*	CHEROKEE CK	FW	695	32	20	63	1,541	*	87		22	0	6	0	10	0
B-679	BIO	CHEROKEE CK	FW														
03050105120																	
B-333	BD/BIO	KINGS CK	FW	238	19	2	11	810				20	0	6	0	10	0
03050105130																	
B-342	BD	LAKE THICKETTY	FW	28	10	0	0					13	0				
B-059	S	IRENE CK	FW	695	23	16	70	1,918	I	76	33.3						
B-095	S	THICKETTY CK	FW	713	23	16	70	1,513	*	49							
B-128	S	LIMESTONE CK	FW	869	24	20	83	1,683	*	76							
B-133	S/BIO	THICKETTY CK	FW	602	23	14	61	1,582	*	76							
B-334	BD/BIO	GILKEY CK	FW	191	19	5	26	764				21	0	7	0	10	0
B-062	P*/BIO	THICKETTY CK	FW	315	31	10	32	1,472	I	87	16.7	23	0	7	0	10	0
03050105140																	
B-739	BIO	BULLOCK CK	FW														
B-325	S	CLARK FORK	FW	118	24	2	8	990	*	74							
B-737	BD	LAKE YORK	FW	2	3	0	0					6	0				
B-326	S	LONG BRANCH	FW	107	24	2	8	705	*	75							
B-157	BIO	CLARK FORK	FW														
B-159	P*	BULLOCK CK	FW	571	32	18	56	3,335	I	87	25	20	0	5	0	10	0

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050105050																								
B-296	BIO	SUCK CK	FW																					
03050105090																								
B-789	BIO	ROSS CK	FW																					
B-788	BIO	BOWEN RVR	FW																					
B-042	P	BROAD RVR	FW	16	1	10	6.3	16	1	6	16	0	0	16	0	0.2	0	15	0	20	0	16	0	0
B-088	S	CANOE CK	FW																					
B-211	S	PEOPLES CK	FW	1	0	10	0	1	0	0	1	0	0	1	0	0.2	0	1	0	20	0	1	0	0
B-100	P*	FURNACE CK	FW	9	0	10	0	9	0	0	9	0	0	9	0	0.2	0	9	0	20	0	9	0	0
B-323	S	DOOLITTLE CK	FW																					
B-343	BD	LAKE CHEROKEE	FW																					
B-330	S	GUYONMOORE CK	FW																					
B-044	P	BROAD RVR	FW	16	0	10	0	16	0	0	16	0	0	16	0	0.2	0	16	0	20	0	16	1	6
03050105100																								
B-740	BIO	BUFFALO CK	FW																					
B-119	S	BUFFALO CK	FW	24	0	10	0	24	1	4	24	0	0	23	0	0.2	0	24	0	20	0	24	0	0
B-057	P*	BUFFALO CK	FW	33	1	10	3	33	3	9	33	0	0	32	0	0.2	0	33	0	20	0	33	0	0
03050105110																								
B-056	P*	CHEROKEE CK	FW	6	0	10	0	6	1	17	6	0	0	6	0	0.2	0	6	0	20	0	6	0	0
B-679	BIO	CHEROKEE CK	FW																					
03050105120																								
B-333	BD/BIO	KINGS CK	FW	6	0	10	0	6	2	33	6	0	0	6	0	0.2	0	6	0	20	0	6	0	0
03050105130																								
B-342	BD	LAKE THICKETTY	FW																					
B-059	S	IRENE CK	FW																					
B-095	S	THICKETTY CK	FW																					
B-128	S	LIMESTONE CK	FW																					
B-133	S/BIO	THICKETTY CK	FW																					
B-334	BD/BIO	GILKEY CK	FW	7	0	10	0	7	0	0	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
B-062	P*/BIO	THICKETTY CK	FW	7	0	10	0	7	0	0	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
03050105140																								
B-739	BIO	BULLOCK CK	FW																					
B-325	S	CLARK FORK	FW																					
B-737	BD	LAKE YORK	FW																					
B-326	S	LONG BRANCH	FW																					
B-157	BIO	CLARK FORK	FW																					
B-159	P*	BULLOCK CK	FW	5	0	10	0	5	0	0	5	0	0	5	0	0.2	0	5	0	20	0	5	1	20

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050105150																				
B-099-7	BIO	VAUGHN CK	ORW																	
B-099A	S	LAKE LANIER	FW	31	0	0		D	80	-0.031	*	79		31	1	3	5.75	D	80	-0.014
B-099B	S	LAKE LANIER	FW	28	0	0		*	77		D	78	-0.035	28	1	4	5.8	D	77	-0.025
B-719	BIO	N PACOLET RVR	FW																	
B-301	S	PAGE CK	FW	30	0	0		*	79		*	79		30	1	3	5.9	D	79	-0.02
B-026	P	N PACOLET RVR	FW	60	0	0		D	172	-0.017	D	172	-0.05	60	0	0		D	170	-0.02
B-126	BD	N PACOLET RVR	FW	21	0	0								21	0	0				
B-791	BIO	OBED CK	FW																	
03050105160																				
B-720	BIO	S PACOLET RVR	FW																	
B-103	P*	SPIVEY CK	FW	40	0	0		*	89		D	87	-0.045	40	2	5	5.85	D	89	-0.017
B-104	BIO	SPIVEY CK	FW																	
B-790	BIO	MOTLOW CK	FW																	
B-302	P*	S PACOLET RVR	FW	40	0	0		*	106		D	89	-0.04	40	0	0		D	106	-0.023
B-340	BD	LAKE BOWEN	FW	12	0	0								12	0	0				
B-339	BD	LAKE BOWEN	FW	13	0	0								13	0	0				
B-113	S	SPARTANBURG RES. #1	FW	28	0	0		D	75	-0.038	D	75	-0.033	28	1	4	5.95	*	75	
03050105170																				
B-028	P*	PACOLET RVR	FW	37	0	0		*	86		D	86	-0.05	37	1	3	9.6	*	86	
B-783	BIO	BUCK CK	FW																	
B-259	S	LITTLE BUCK CK	FW	28	0	0		*	75		D	75	-0.022	28	1	4	5.65	*	75	
B-347	BD	LAKE BLALOCK	FW	13	0	0								13	0	0				
B-163A	P*	PACOLET RVR	FW	40	0	0		*	91		D	90	-0.083	41	0	0		D	92	-0.029
B-191	S	POTTER BRANCH	FW	30	0	0		I	79	0.068	D	78	-0.1	30	0	0		D	79	-0.015
B-331	BD	PACOLET RVR	FW	22	0	0								22	0	0				
03050105180																				
B-221	S/BIO	LAWSONS FORK CK	FW	28	0	0		I	75	0.06	D	75	-0.189	28	1	4	5.95	D	74	-0.021
B-277	S	LAWSONS FORK CK	FW	29	0	0		I	76	0.1	D	76	-0.1	29	0	0		D	74	-0.021
B-278	S	LAWSONS FORK CK	FW	29	0	0		I	76	0.1	D	76	-0.13	29	0	0		D	75	-0.025
B-531	BIO	MEADOW CK	FW																	
BL-005	P*	LAWSONS FORK CK	FW	40	0	0		*	92		D	91	-0.055	40	1	3	5.7	D	92	-0.028
BL-001	P/BIO	LAWSONS FORK CK	FW	60	0	0		*	176		D	171	-0.067	60	0	0		D	174	-0.025
03050105190																				
BP-001	S	PACOLET RVR	FW	30	0	0		*	79		D	79	-0.033	30	0	0		D	79	-0.022
B-780	BIO	MILL CK	FW																	
B-048	P	PACOLET RVR	FW	52	0	0		*	167		D	164	-0.042	52	0	0		*	166	

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050105150																		
B-099-7	BIO	VAUGHN CK	ORW															
B-099A	S	LAKE LANIER	FW	*	30		*	72					I	78	0.333			
B-099B	S	LAKE LANIER	FW				*	68					*	77				
B-719	BIO	N PACOLET RVR	FW															
B-301	S	PAGE CK	FW	*	33		*	74					D	78	-0.178			
B-026	P	N PACOLET RVR	FW	D	83	-0.01	D	162	-0.003	D	144	-0.02	*	172				
B-126	BD	N PACOLET RVR	FW															
B-791	BIO	OBED CK	FW															
03050105160																		
B-720	BIO	S PACOLET RVR	FW															
B-103	P*	SPIVEY CK	FW	*	43		*	85					D	88	-0.323	*	33	
B-104	BIO	SPIVEY CK	FW															
B-790	BIO	MOTLOW CK	FW															
B-302	P*	S PACOLET RVR	FW	*	45		D	101	-0.001				D	105	-0.717	D	47	-1.6
B-340	BD	LAKE BOWEN	FW															
B-339	BD	LAKE BOWEN	FW															
B-113	S	SPARTANBURG RES. #1	FW	*	31		*	71					*	74				
03050105170																		
B-028	P*	PACOLET RVR	FW	D	43	-0.01	*	85					*	86		D	33	-4.783
B-783	BIO	BUCK CK	FW															
B-259	S	LITTLE BUCK CK	FW	*	33		*	75					*	74				
B-347	BD	LAKE BLALOCK	FW															
B-163A	P*	PACOLET RVR	FW	I	46	0.01	*	87					*	90				
B-191	S	POTTER BRANCH	FW	D	36	-0.01	D	77	-0.098				*	75				
B-331	BD	PACOLET RVR	FW															
03050105180																		
B-221	S/BIO	LAWSONS FORK CK	FW	I	33	0.014	D	74	-0.01				*	73				
B-277	S	LAWSONS FORK CK	FW	I	32	0.01	D	74	-0.004				*	74				
B-278	S	LAWSONS FORK CK	FW	I	33	0.143	*	74					*	74				
B-531	BIO	MEADOW CK	FW															
BL-005	P*	LAWSONS FORK CK	FW	I	50	0.017	*	91					*	90				
BL-001	P/BIO	LAWSONS FORK CK	FW	*	82		D	159	-0.013	I	158	0.044	*	171		D	147	-0.247
03050105190																		
BP-001	S	PACOLET RVR	FW	*	37		D	78	-0.004				*	76				
B-780	BIO	MILL CK	FW															
B-048	P	PACOLET RVR	FW	*	78		D	157	-0.002	*	147		*	166				

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050105150																	
B-099-7	BIO	VAUGHN CK	ORW														
B-099A	S	LAKE LANIER	FW	175	30	4	13	1,503	*	77							
B-099B	S	LAKE LANIER	FW	10	28	0	0		*	76							
B-719	BIO	N PACOLET RVR	FW														
B-301	S	PAGE CK	FW	721	29	22	76	1,275	I	77	30						
B-026	P	N PACOLET RVR	FW	439	59	31	53	1,134	I	172	8	55	0	19	0	10	0
B-126	BD	N PACOLET RVR	FW	1,213	21	9	43	5,120				22	0	8	0	10	0
B-791	BIO	OBED CK	FW														
03050105160																	
B-720	BIO	S PACOLET RVR	FW														
B-103	P*	SPIVEY CK	FW	185	40	10	25	841	*	88		22	0	8	0	10	0
B-104	BIO	SPIVEY CK	FW														
B-790	BIO	MOTLOW CK	FW														
B-302	P*	S PACOLET RVR	FW	334	39	13	33	688	*	90		22	0	8	0	10	0
B-340	BD	LAKE BOWEN	FW	42	12	1	8	1,800				12	0				
B-339	BD	LAKE BOWEN	FW	3	12	0	0					12	0				
B-113	S	SPARTANBURG RES. #1	FW	115	28	1	4	690	I	74	6.8						
03050105170																	
B-028	P*	PACOLET RVR	FW	377	38	10	26	2,922	*	86		22	0	8	0	10	0
B-783	BIO	BUCK CK	FW														
B-259	S	LITTLE BUCK CK	FW	343	28	8	29	1,855	*	74							
B-347	BD	LAKE BLALOCK	FW	10	12	1	8	1,000				12	0				
B-163A	P*	PACOLET RVR	FW	105	41	4	10	823	*	91		21	0	8	0	10	0
B-191	S	POTTER BRANCH	FW	395	29	10	34	3,371	*	78							
B-331	BD	PACOLET RVR	FW	221	22	5	23	2,612				21	0	8	0	10	0
03050105180																	
B-221	S/BIO	LAWSONS FORK CK	FW	4,736	28	28	100	5,948	I	74	83.3						
B-277	S	LAWSONS FORK CK	FW	2,596	29	28	97	3,242	*	75							
B-278	S	LAWSONS FORK CK	FW	3,212	29	28	97	4,382	I	75	100						
B-531	BIO	MEADOW CK	FW														
BL-005	P*	LAWSONS FORK CK	FW	708	40	24	60	1,219	*	92		22	0	8	0	10	0
BL-001	P/BIO	LAWSONS FORK CK	FW	647	59	21	36	11,501	I	172	16.9	57	0	19	0	10	0
03050105190																	
BP-001	S	PACOLET RVR	FW	232	30	8	27	4,043	*	79		1	0	1	0	10	0
B-780	BIO	MILL CK	FW														
B-048	P	PACOLET RVR	FW	329	52	19	37	1,724	*	167		51	0	16	0	10	0

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050105150																								
B-099-7	BIO	VAUGHN CK	ORW																					
B-099A	S	LAKE LANIER	FW																					
B-099B	S	LAKE LANIER	FW																					
B-719	BIO	N PACOLET RVR	FW																					
B-301	S	PAGE CK	FW																					
B-026	P	N PACOLET RVR	FW	19	0	10	0	19	1	5	19	0	0	19	0	0.2	0	19	0	20	0	19	0	0
B-126	BD	N PACOLET RVR	FW	8	0	10	0	8	0	0	8	1	13	8	0	0.2	0	8	0	20	0	8	0	0
B-791	BIO	OBED CK	FW																					
03050105160																								
B-720	BIO	S PACOLET RVR	FW																					
B-103	P*	SPIVEY CK	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
B-104	BIO	SPIVEY CK	FW																					
B-790	BIO	MOTLOW CK	FW																					
B-302	P*	S PACOLET RVR	FW	8	0	10	0	8	0	0	8	1	13	8	0	0.2	0	8	0	20	0	8	0	0
B-340	BD	LAKE BOWEN	FW																					
B-339	BD	LAKE BOWEN	FW																					
B-113	S	SPARTANBURG RES. #1	FW																					
03050105170																								
B-028	P*	PACOLET RVR	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
B-783	BIO	BUCK CK	FW																					
B-259	S	LITTLE BUCK CK	FW																					
B-347	BD	LAKE BLALOCK	FW																					
B-163A	P*	PACOLET RVR	FW	8	0	10	0	8	1	13	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
B-191	S	POTTER BRANCH	FW																					
B-331	BD	PACOLET RVR	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
03050105180																								
B-221	S/BIO	LAWSONS FORK CK	FW																					
B-277	S	LAWSONS FORK CK	FW																					
B-278	S	LAWSONS FORK CK	FW																					
B-531	BIO	MEADOW CK	FW																					
BL-005	P*	LAWSONS FORK CK	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.3	0	8	0	20	0	8	0	0
BL-001	P/BIO	LAWSONS FORK CK	FW	19	1	10	5.3	19	0	0	19	0	0	19	0	0.2	0	19	0	20	0	19	1	5
03050105190																								
BP-001	S	PACOLET RVR	FW	1	0	10	0	1	0	0	1	0	0	1	0	0.5	0	1	0	20	0	1	0	0
B-780	BIO	MILL CK	FW																					
B-048	P	PACOLET RVR	FW	16	0	10	0	16	0	0	16	0	0	16	0	0.2	0	16	0	20	0	16	0	0

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050106010																				
B-344	BD	LAKE LONG	FW	15	0	0								11	4	36	9.2			
B-778	BIO	NEALS CK	FW																	
B-046	P	BROAD RVR	FW	53	1	2	0.5	*	169		D	160	-0.1	53	0	0		D	168	-0.023
03050106020																				
B-086	S	ROSS BRANCH	FW	23	0	0		*	76		*	75		23	0	0		D	76	-0.025
B-136	BD/BIO	TURKEY CK	FW	20	0	0								20	0	0				
03050106030																				
B-064	S	MENG CK	FW	22	0	0		*	76		D	72	-0.1	22	0	0		D	76	-0.025
B-243	S	MENG CK TRIB	FW	23	0	0		I	75	0.106	D	73	-0.3	23	0	0		*	76	
B-155	BD/BIO	BROWNS CK	FW	20	0	0								20	0	0				
B-335	BD	GREGORYS CK	FW	20	0	0								20	0	0				
03050106040																				
CL-023	BD	CHESTER ST PARK LAKE	FW	11	0	0								7	0	0				
B-074	S	DRY FORK	FW	23	0	0		*	77		*	75		23	0	0		D	77	-0.02
B-075	P*/BIO	SANDY RVR	FW	33	0	0		*	87		*	83		33	0	0		D	87	-0.05
03050106050																				
B-047	P*	BROAD RVR	FW	38	0	0		*	91		*	87		38	2	5	3.54	*	91	
B-151	BIO	HELLERS CK	FW																	
B-346	BD	LAKE, PARR RESERVOIR	FW	13	0	0								13	0	0				
B-751	BIO	CANNONS CK	FW																	
B-328	P	LAKE, MONTICELLO	FW	68	1	1	1	D	195	-0.04	D	165	-0.086	67	0	0		D	195	-0.035
B-327	P	LAKE, MONTICELLO	FW	66	2	3	4.7	*	199		*	164		66	5	8	8.694	*	199	
B-345	BD	LAKE, PARR RESERVOIR	FW	13	0	0								13	1	8	5.9			
03050106060																				
B-236	P	BROAD RVR	FW	58	0	0		*	176		*	165		58	2	3	5.8	*	176	
B-800	BIO	CRIMS CK	FW																	
B-801	BIO	WATEREE CK	FW																	
B-110	S	ELIZABETH LAKE	FW	29	1	3	3.7	*	81		*	75		29	4	14	5.65	I	81	0.05
B-081	BIO	CRANE CK	FW																	
B-316	P	CRANE CK	FW	56	2	4	4.175	*	126		*	117		56	3	5	6.703	*	126	
B-280	P/BIO	SMITH BRANCH	FW	57	0	0		I	171	0.071	*	152		57	1	2	5.78	*	171	
B-337	BD	BROAD RVR	FW	21	0	0								21	0	0				
B-080	P	BROAD RVR	FW	55	0	0		*	171		*	160		55	2	4	8.69	*	171	

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050106010																		
B-344	BD	LAKE LONG	FW															
B-778	BIO	NEALS CK	FW															
B-046	P	BROAD RVR	FW	*	75		*	155		D	151	-0.016		163		*	58	
03050106020																		
B-086	S	ROSS BRANCH	FW	*	34		I	72	0.001				*	73				
B-136	BD/BIO	TURKEY CK	FW															
03050106030																		
B-064	S	MENG CK	FW	D	36	-0.012	D	75	-0.013				*	76				
B-243	S	MENG CK TRIB	FW	D	37	-0.005	D	74	-0.026				D	76	-0.6			
B-155	BD/BIO	BROWNS CK	FW															
B-335	BD	GREGORYS CK	FW															
03050106040																		
CL-023	BD	CHESTER ST PARK LAKE	FW															
B-074	S	DRY FORK	FW	*	36		*	74					*	75				
B-075	P*/BIO	SANDY RVR	FW	*	43		D	80	-0.004				*	87				
03050106050																		
B-047	P*	BROAD RVR	FW	*	44		*	85					I	85	0.858	*	32	
B-151	BIO	HELLERS CK	FW															
B-346	BD	LAKE, PARR RESERVOIR	FW															
B-751	BIO	CANNONS CK	FW															
B-328	P	LAKE, MONTICELLO	FW	*	87		D	166	0.0	D	164	-0.038	D	164	-0.133			
B-327	P	LAKE, MONTICELLO	FW	*	86		D	164	0.0	D	155	-0.005	*	161				
B-345	BD	LAKE, PARR RESERVOIR	FW															
03050106060																		
B-236	P	BROAD RVR	FW	*	82		*	162		D	162	-0.01	I	160	0.4	*	152	
B-800	BIO	CRIMS CK	FW															
B-801	BIO	WATEREE CK	FW															
B-110	S	ELIZABETH LAKE	FW	*	35		D	75	-0.001				*	74				
B-081	BIO	CRANE CK	FW															
B-316	P	CRANE CK	FW	D	76	-0.002	D	118	-0.012	D	71	-0.025	*	118				
B-280	P/BIO	SMITH BRANCH	FW	I	77	0.007	*	155		D	152	-0.016	*	155				
B-337	BD	BROAD RVR	FW															
B-080	P	BROAD RVR	FW	*	76		D	159	-0.001	*	154		*	160				

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050106010																	
B-344	BD	LAKE LONG	FW	1	10	0	0					12	0				
B-778	BIO	NEALS CK	FW														
B-046	P	BROAD RVR	FW	125	53	10	19	1,990	*	163		51	0	15	1	10	6.7
03050106020																	
B-086	S	ROSS BRANCH	FW	1,800	23	22	96	2,605	*	76				8	0	10	0
B-136	BD/BIO	TURKEY CK	FW	210	20	3	15	2,680				22	0	7	0	10	0
03050106030																	
B-064	S	MENG CK	FW	626	22	18	82	979	*	76							
B-243	S	MENG CK TRIB	FW	976	23	20	87	1,360	*	76							
B-155	BD/BIO	BROWNS CK	FW	208	20	5	25	1,648				22	0	7	0	10	0
B-335	BD	GREGORYS CK	FW	219	20	6	30	1,163				21	0	6	0	10	0
03050106040																	
CL-023	BD	CHESTER ST PARK LAKE	FW	3	3	0	0					6	0				
B-074	S	DRY FORK	FW	840	22	16	73	1,665	*	75							
B-075	P*/BIO	SANDY RVR	FW	385	33	14	42	961	*	86		22	0	7	0	10	0
03050106050																	
B-047	P*	BROAD RVR	FW	94	36	4	11	875	*	86		12	0	4	0	10	0
B-151	BIO	HELLERS CK	FW														
B-346	BD	LAKE, PARR RESERVOIR	FW	74	11	0	0					11	0	1	0	10	0
B-751	BIO	CANNONS CK	FW														
B-328	P	LAKE, MONTICELLO	FW	2	58	0	0		*	166		58	0	18	0	10	0
B-327	P	LAKE, MONTICELLO	FW	2	58	0	0		*	165		56	0	19	0	10	0
B-345	BD	LAKE, PARR RESERVOIR	FW	10	12	0	0					12	0	1	0	10	0
03050106060																	
B-236	P	BROAD RVR	FW	28	58	1	2	430	*	165		57	0	19	0	10	0
B-800	BIO	CRIMS CK	FW														
B-801	BIO	WATEREE CK	FW														
B-110	S	ELIZABETH LAKE	FW	46	28	3	11	3,820	I	76	2.3			1	0	10	0
B-081	BIO	CRANE CK	FW														
B-316	P	CRANE CK	FW	242	55	12	22	3,712	D	118	-20	53	0	21	0	10	0
B-280	P/BIO	SMITH BRANCH	FW	2,173	56	50	89	6,604	*	158		55	0	19	0	10	0
B-337	BD	BROAD RVR	FW	107	22	3	14	1,447				22	0	7	0	10	0
B-080	P	BROAD RVR	FW	62	54	7	13	977	D	162	-3.6	53	0	19	0	10	0

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050106010																								
B-344	BD	LAKE LONG	FW																					
B-778	BIO	NEALS CK	FW																					
B-046	P	BROAD RVR	FW	15	0	10	0	15	0	0	15	0	0	15	0	0.2	0	15	0	20	0	15	0	0
03050106020																								
B-086	S	ROSS BRANCH	FW	8	0	10	0	8	0	0	8	0	0	8	0	0.2	0	8	0	20	0	8	0	0
B-136	BD/BIO	TURKEY CK	FW	7	0	10	0	7	0	0	7	0	0	7	0	0.2	0	7	0	20	0	7	1	14
03050106030																								
B-064	S	MENG CK	FW																					
B-243	S	MENG CK TRIB	FW																					
B-155	BD/BIO	BROWNS CK	FW	7	0	10	0	7	2	29	7	0	0	7	0	0.2	0	7	0	20	0	7	1	14
B-335	BD	GREGORYS CK	FW	6	0	10	0	6	0	0	6	0	0	6	0	0.2	0	6	0	20	0	6	0	0
03050106040																								
CL-023	BD	CHESTER ST PARK LAKE	FW																					
B-074	S	DRY FORK	FW																					
B-075	P*/BIO	SANDY RVR	FW	7	0	10	0	7	0	0	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
03050106050																								
B-047	P*	BROAD RVR	FW	4	0	10	0	4	0	0	4	0	0	4	0	0.2	0	4	0	20	0	4	0	0
B-151	BIO	HELLERS CK	FW																					
B-346	BD	LAKE, PARR RESERVOIR	FW	1	0	10	0	1	0	0	1	0	0	1	0	0.2	0	1	0	20	0	1	0	0
B-751	BIO	CANNONS CK	FW																					
B-328	P	LAKE, MONTICELLO	FW	18	0	10	0	18	1	6	18	0	0	18	0	0.2	0	18	0	20	0	18	0	0
B-327	P	LAKE, MONTICELLO	FW	19	0	10	0	19	0	0	19	0	0	19	0	0.2	0	19	0	20	0	19	1	5
B-345	BD	LAKE, PARR RESERVOIR	FW	1	0	10	0	1	0	0	1	0	0	1	0	0.2	0	1	0	20	0	1	0	0
03050106060																								
B-236	P	BROAD RVR	FW	19	0	10	0	19	0	0	19	0	0	19	0	0.2	0	19	0	20	0	19	0	0
B-800	BIO	CRIMS CK	FW																					
B-801	BIO	WATEREE CK	FW																					
B-110	S	ELIZABETH LAKE	FW	1	0	10	0	1	0	0	1	0	0	1	0	0.2	0	1	0	20	0	1	0	0
B-081	BIO	CRANE CK	FW																					
B-316	P	CRANE CK	FW	21	0	10	0	21	1	5	21	0	0	21	0	0.2	0	21	0	20	0	21	2	10
B-280	P/BIO	SMITH BRANCH	FW	19	1	10	5.3	19	0	0	19	0	0	19	0	0.2	0	19	0	20	0	19	2	11
B-337	BD	BROAD RVR	FW	7	0	10	0	7	0	0	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
B-080	P	BROAD RVR	FW	19	1	10	5.3	18	3	17	19	0	0	19	0	0.2	0	18	0	20	0	18	1	6

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (85 -99) DO	N	MAG	BOD	N	MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (85-99) PH	N	MAG
03050106070																				
B-145	P*/BIO	LITTLE RVR	FW	39	0	0		*	93		D	86	-0.055	39	1	3	5.9	*	92	
03050106080																				
B-123	S	WINNSBORO BRANCH	FW	28	0	0		I	79	0.044	D	73	-0.075	28	1	4	5.25	*	78	
B-077	S	WINNSBORO BRANCH	FW	29	0	0		*	81		*	73		29	1	3	5.3	*	80	
B-102	BD/BIO	JACKSON CK	FW	22	0	0								22	0	0				
B-338	BD	MILL CK	FW	22	0	0								22	2	9	5.9			
03050106090																				
B-320	BD/BIO	BIG CEDAR CK	FW	22	0	0								22	0	0				

BROAD RIVER BASIN WATER QUALITY SUMMARY

STATION				TRENDS (92-99)			TRENDS (85-99)											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050106070																		
B-145	P*/BIO	LITTLE RVR	FW	*	47		D	86	-0.002				*	87				
03050106080																		
B-123	S	WINNSBORO BRANCH	FW	*	35		*	73					*	70				
B-077	S	WINNSBORO BRANCH	FW	I	36	0.175	D	74	-0.065				*	71				
B-102	BD/BIO	JACKSON CK	FW															
B-338	BD	MILL CK	FW															
03050106090																		
B-320	BD/BIO	BIG CEDAR CK	FW															

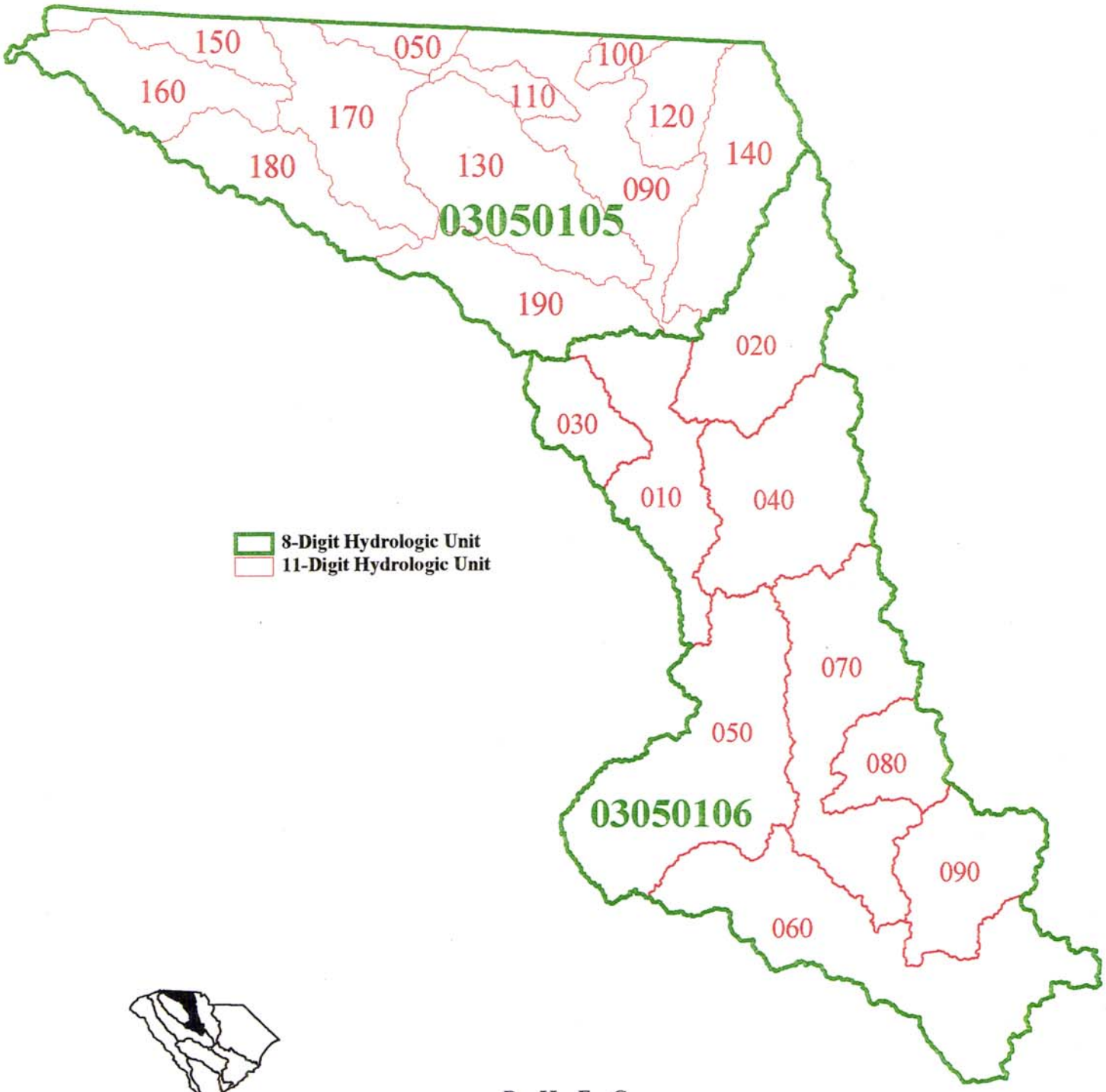
BROAD RIVER BASIN WATER QUALITY SUMMARY

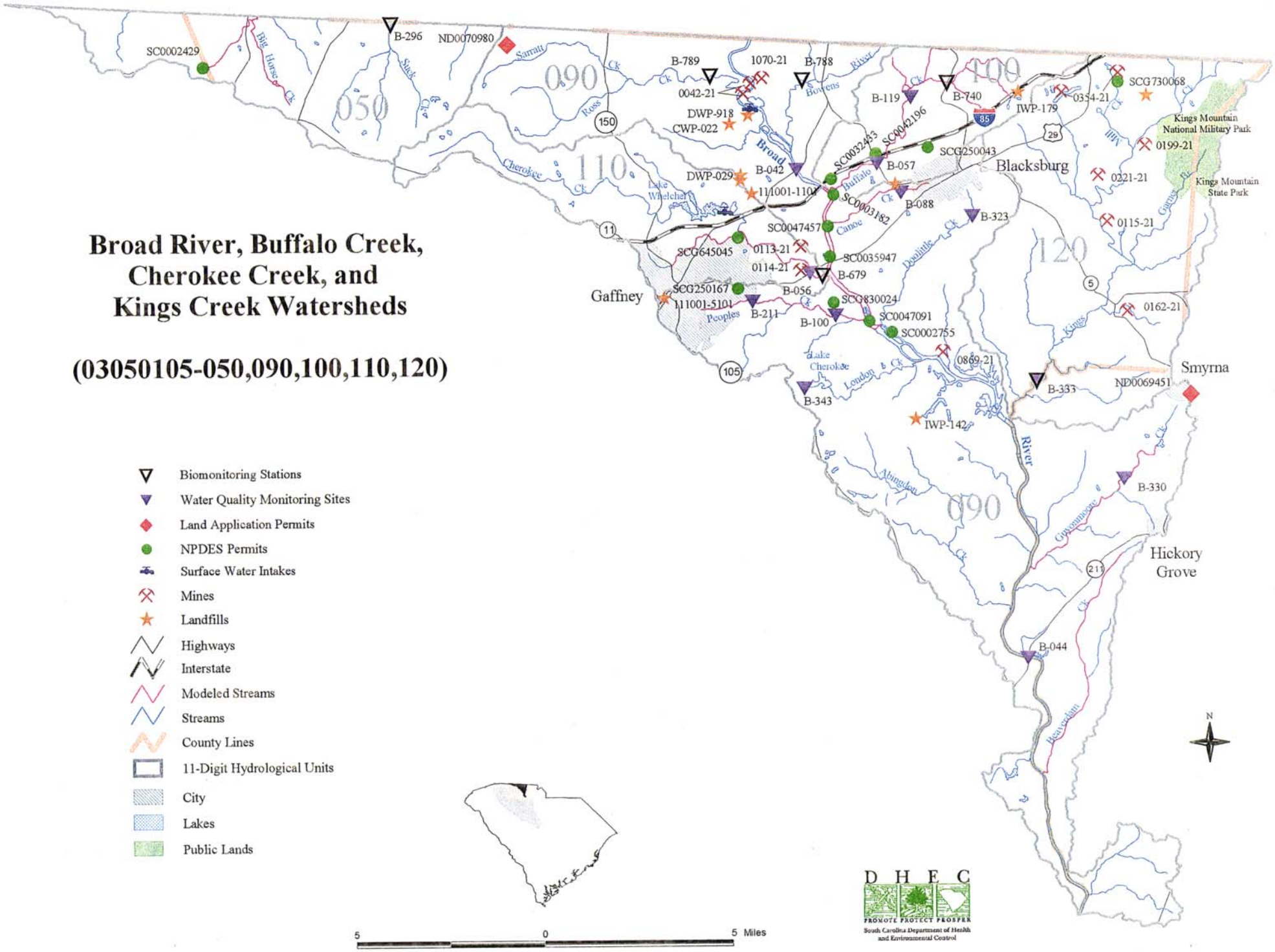
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (85-99) BACT	TRENDS (85-99) N	TRENDS (85-99) MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050106070																	
B-145	P*/BIO	LITTLE RVR	FW	361	36	10	28	931	*	87		10	0	4	0	10	0
03050106080																	
B-123	S	WINNSBORO BRANCH	FW	1,029	29	23	79	2,954	*	74				1	0	10	0
B-077	S	WINNSBORO BRANCH	FW	692	28	18	64	1,993	*	73		1	0	8	0	10	0
B-102	BD/BIO	JACKSON CK	FW	555	22	5	23	2,242				21	0	7	0	10	0
B-338	BD	MILL CK	FW	486	20	12	60	942				20	0	6	0	10	0
03050106090																	
B-320	BD/BIO	BIG CEDAR CK	FW	486	20	5	25	1,928				20	0	7	0	10	0

BROAD RIVER BASIN WATER QUALITY SUMMARY

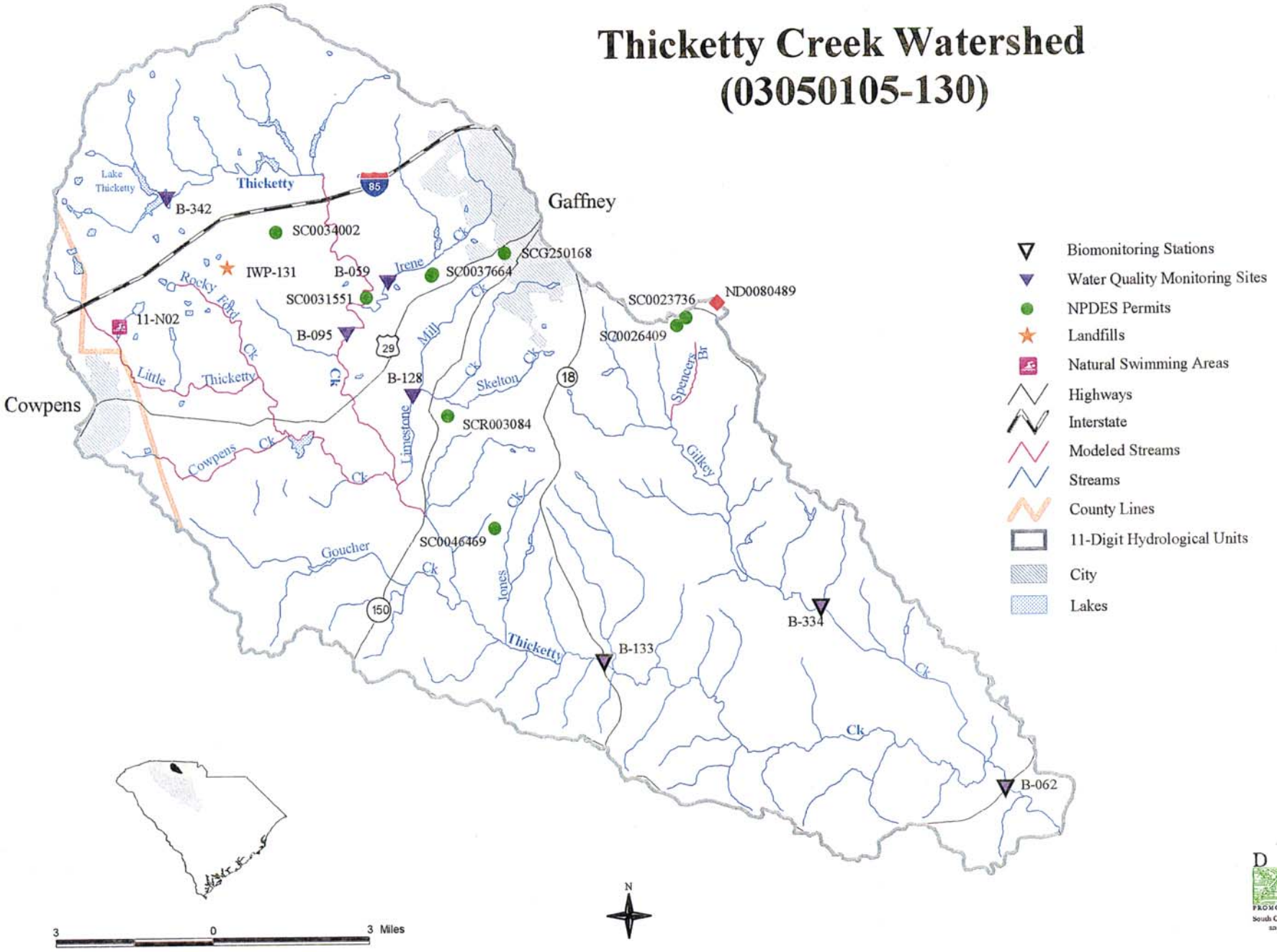
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI MED.	NI %	ZN N	ZN EXC.	ZN %
03050106070																								
B-145	P*/BIO	LITTLE RVR	FW	4	0	10	0	4	1	25	4	0	0	4	0	0.2	0	4	0	20	0	4	1	25
03050106080																								
B-123	S	WINNSBORO BRANCH	FW	1	0	10	0	1	1	100	1	0	0	1	0	0.2	0	1	0	20	0	1	0	0
B-077	S	WINNSBORO BRANCH	FW	8	1	10	13	8	2	25	8	0	0	6	0	0.2	0	8	0	20	0	8	3	38
B-102	BD/BIO	JACKSON CK	FW	7	1	10	14	7	1	14	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0
B-338	BD	MILL CK	FW	6	0	10	0	6	1	17	6	0	0	6	0	0.2	0	6	0	20	0	6	0	0
03050106090																								
B-320	BD/BIO	BIG CEDAR CK	FW	7	0	10	0	7	1	14	7	0	0	7	0	0.2	0	7	0	20	0	7	0	0

Broad River Basin
Watershed Unit Index Map



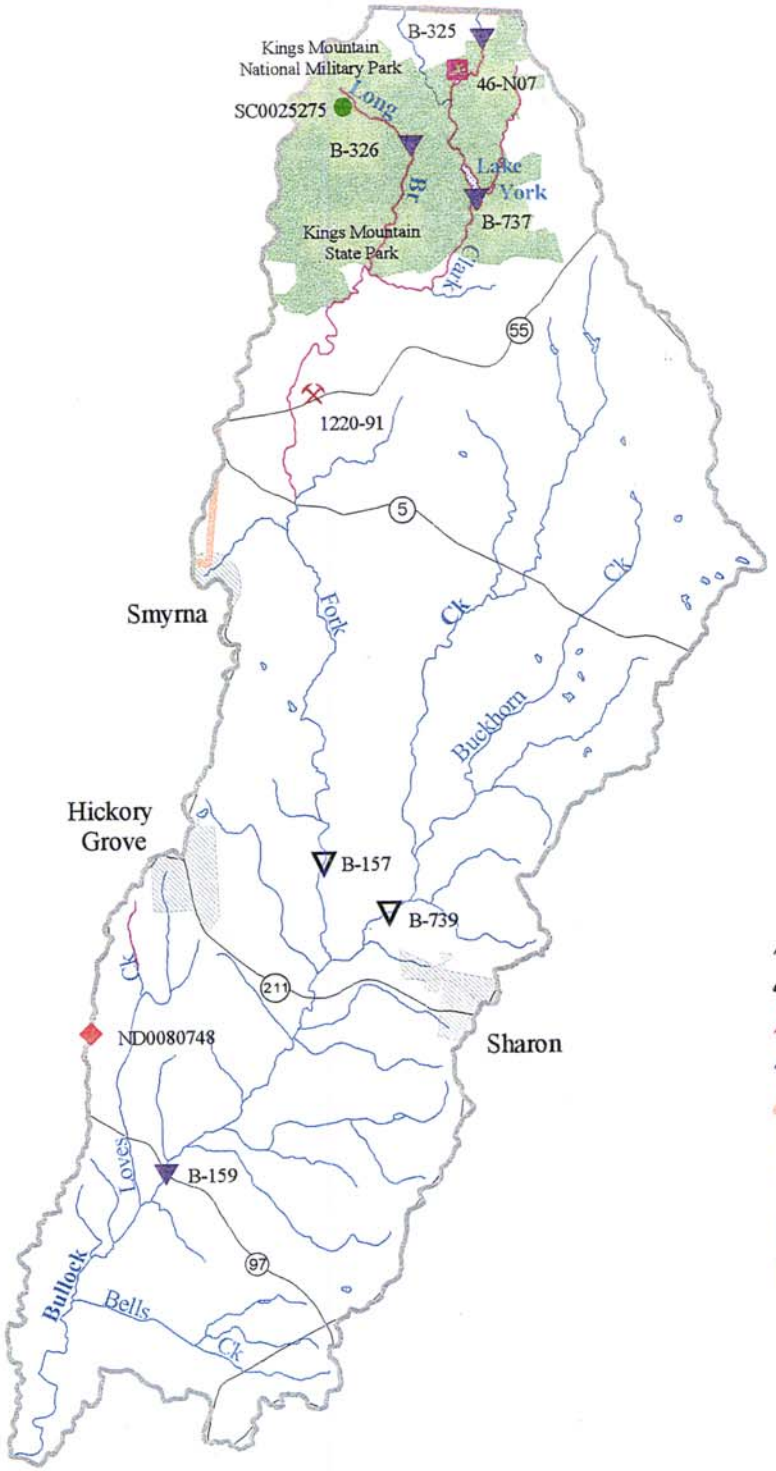

Broad River, Buffalo Creek, Cherokee Creek, and Kings Creek Watersheds
(03050105-050,090,100,110,120)
Biomonitoring Stations
Water Quality Monitoring Sites
Land Application Permits
NPDES Permits
Surface Water Intakes
Mines
Landfills
Highways
Interstate
Modeled Streams
Streams
County Lines
11-Digit Hydrological Units
City
Lakes
Public Lands
B-296
ND0070980
SC0002429
Big Horse Ck
Sandy Run Ck
Sarratt Ck
050
090
100
110
120
B-789
1070-21
B-788
0042-21
DWP-918
CWP-022
Ross Ck
S Bowens Ck
Broad River
B-119
B-740
IWP-179
0354-21
SCG730068
Kings Mountain National Military Park
0199-21
SC0042196
SC0032453
SCG250043
Blacksburg
B-042
B-057
DWP-029
11/1001-1101
Cherokee Ck
Lake Wheelchair
Buffalo Ck
SC0003182
B-088
0221-21
Kings Mountain State Park
Gaffney
SC0047457
Canoe Ck
B-323
0115-21
SCG645045
0113-21
0114-21
SC0035947
B-679
Doolittle Ck
SCG250167
111001-5101
B-056
B-211
Peoples Ck
SC0830024
B-100
SC0047091
SC0002755
0162-21
Kings Ck
Lake Cherokee
London Ck
0869-21
Smyrna
ND0069451
B-333
B-343
IWP-142
Broad River
Abingdon Ck
B-330
Cowpasture Ck
Hickory Grove
B-044
Beaverdam Ck
N
5 0 5 Miles
D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Thicketty Creek Watershed (03050105-130)



D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Bullock Creek Watershed
(03050105-140)



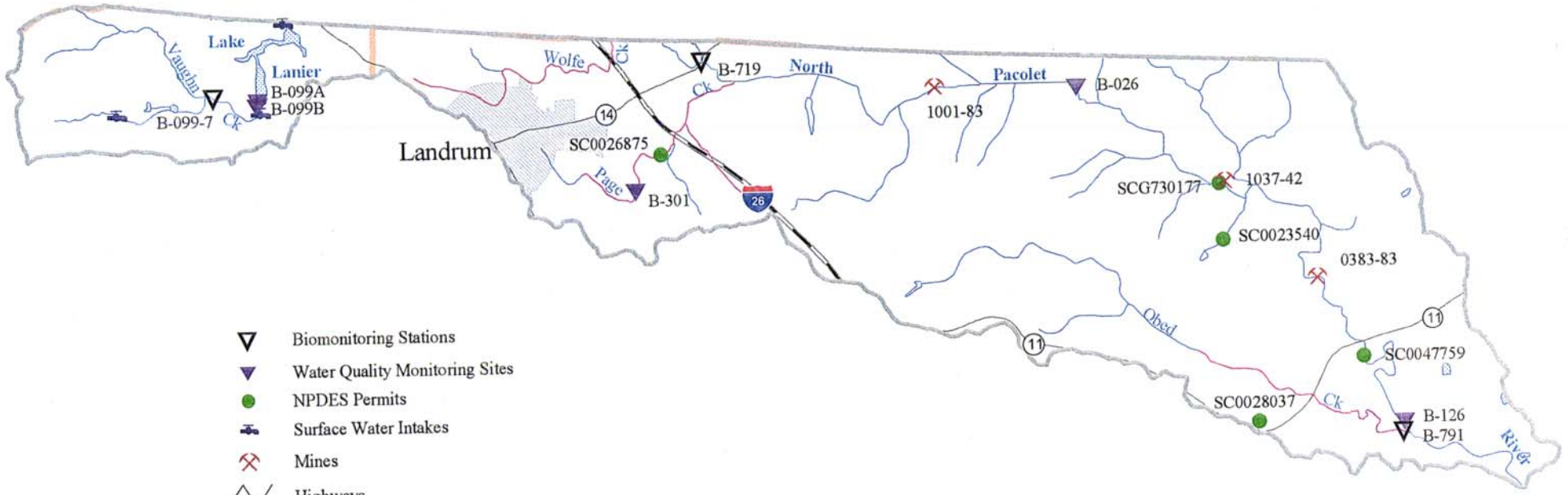
- Biomonitoring Stations
- Water Quality Monitoring Sites
- Land Application Permits
- NPDES Permits
- Mines
- Natural Swimming Areas
- Highways
- Interstate
- Modeled Streams
- Streams
- County Lines
- 11-Digit Hydrological Units
- City
- Lakes
- Public Lands

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

N

4 0 4 Miles

North Pacolet River Watershed
(03050105-150)



- Biomonitoring Stations
- Water Quality Monitoring Sites
- NPDES Permits
- Surface Water Intakes
- Mines
- Highways
- Interstate
- Modeled Streams
- Streams
- County Lines
- 11-Digit Hydrological Units
- City
- Lakes

D H E C

PROMOTE PROTECT PROSPER

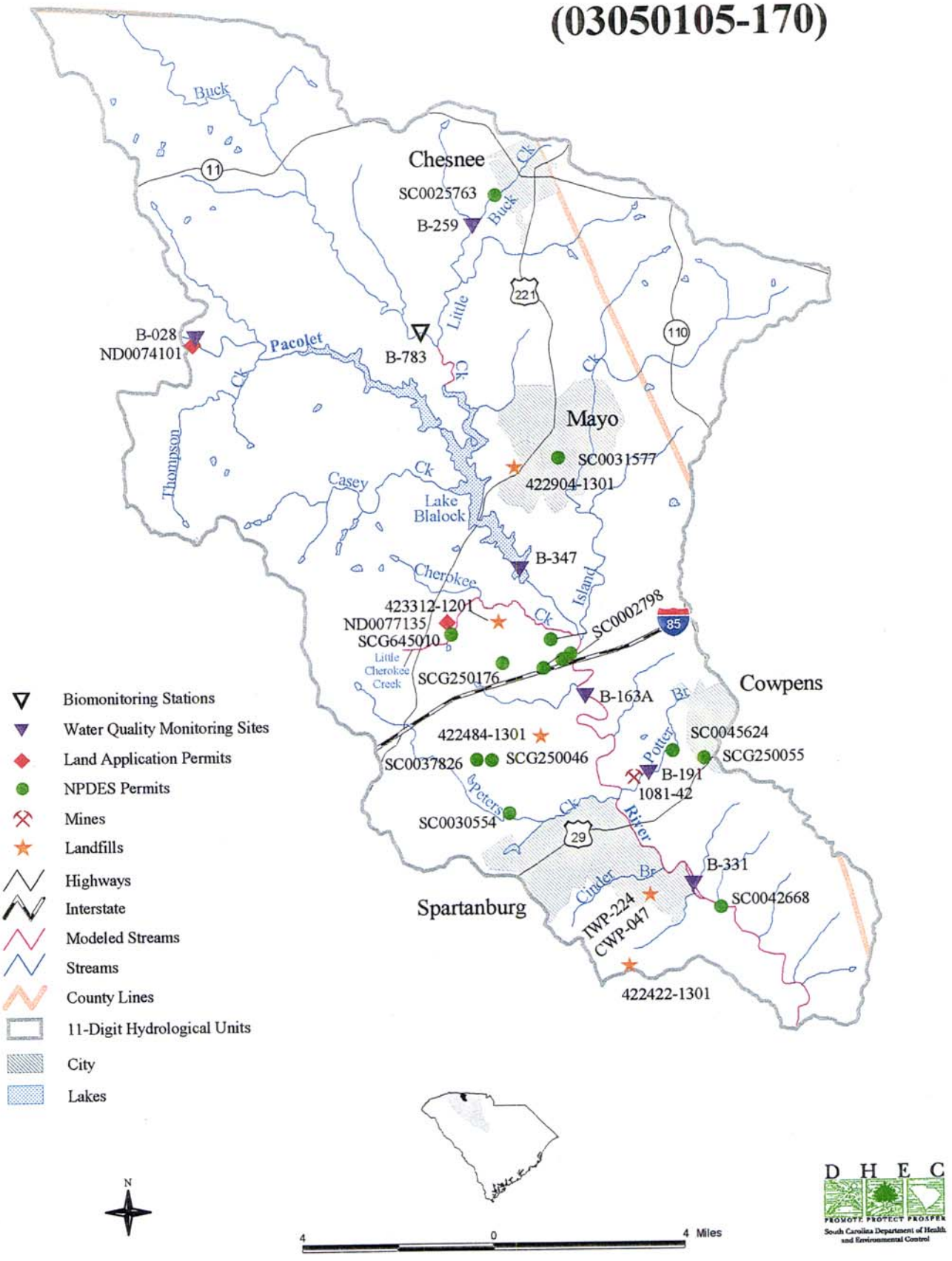
South Carolina Department of Health and Environmental Control

N

3 0 3 Miles

South Pacolet River Watershed
(03050105-160)

Pacolet River Watershed (03050105-170)

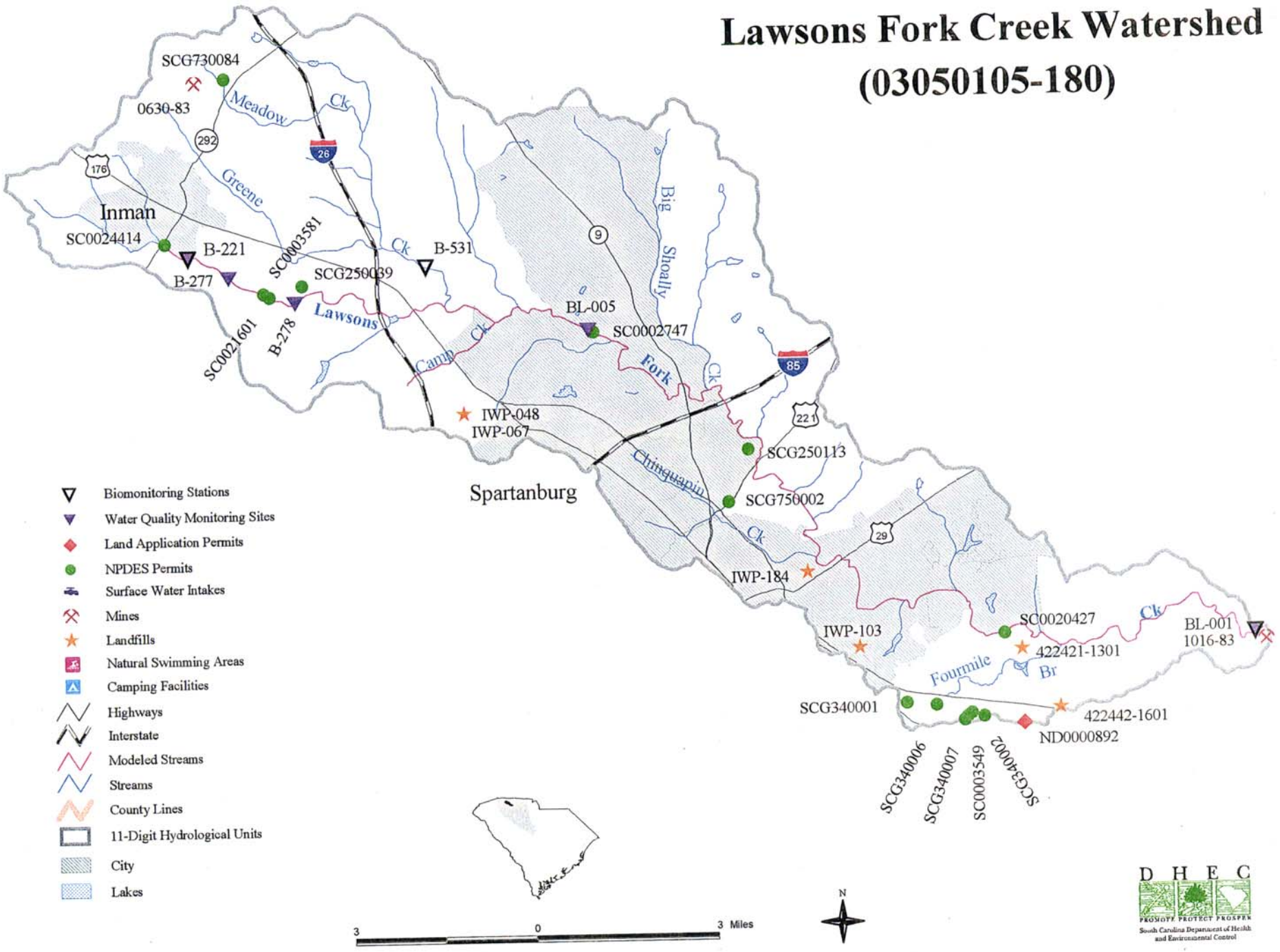


D H E C

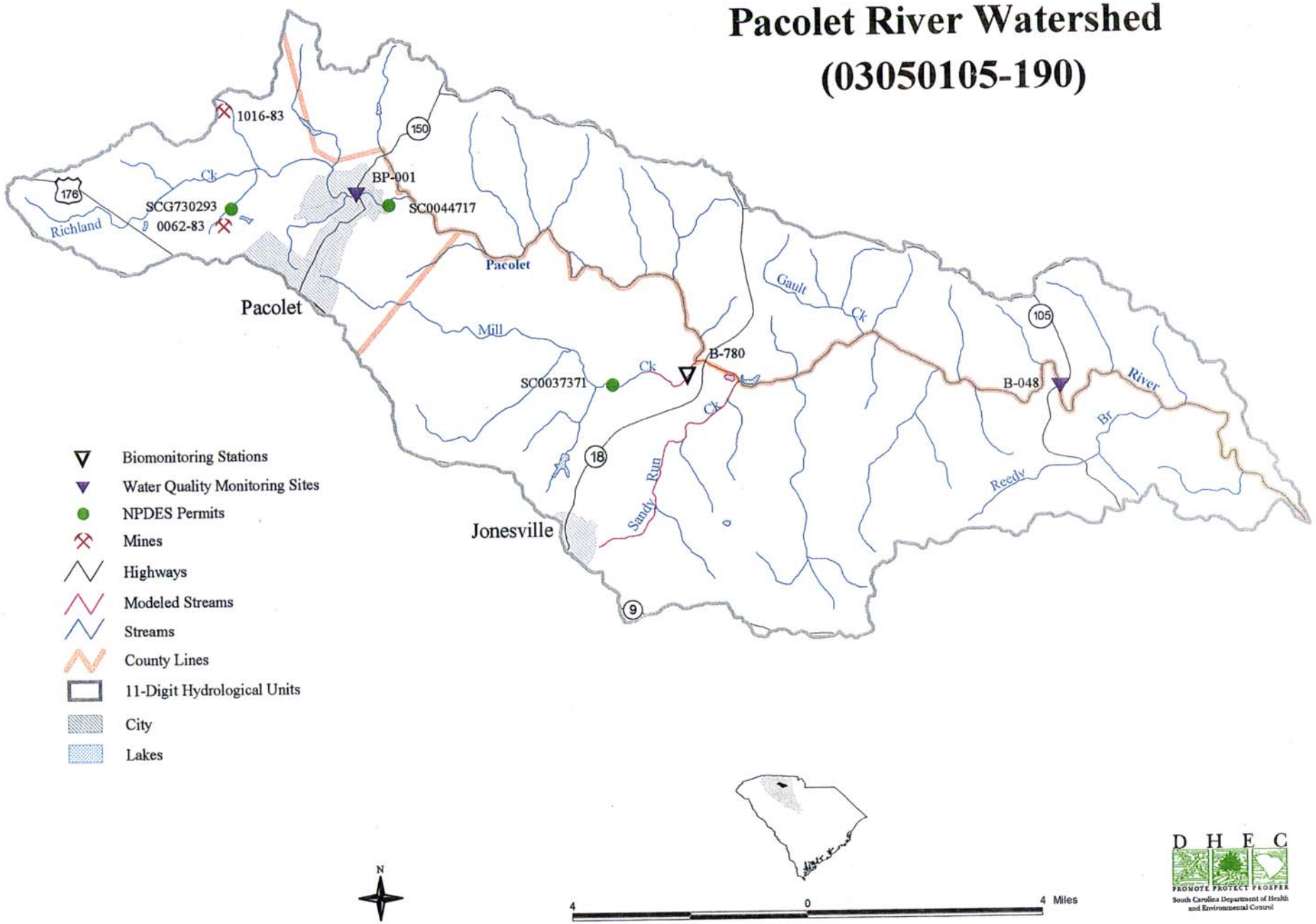
PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Lawsons Fork Creek Watershed (03050105-180)

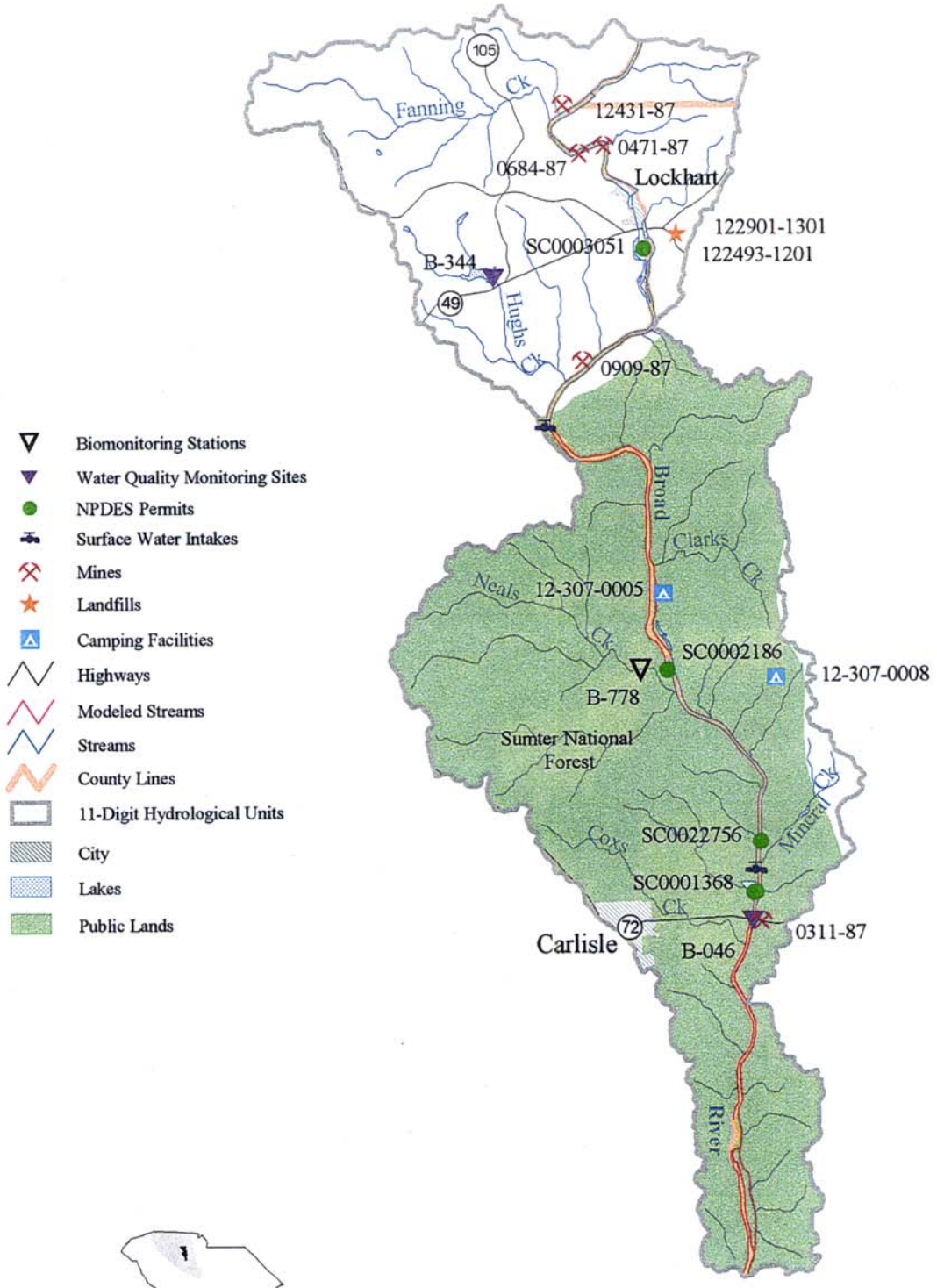


Pacolet River Watershed
(03050105-190)



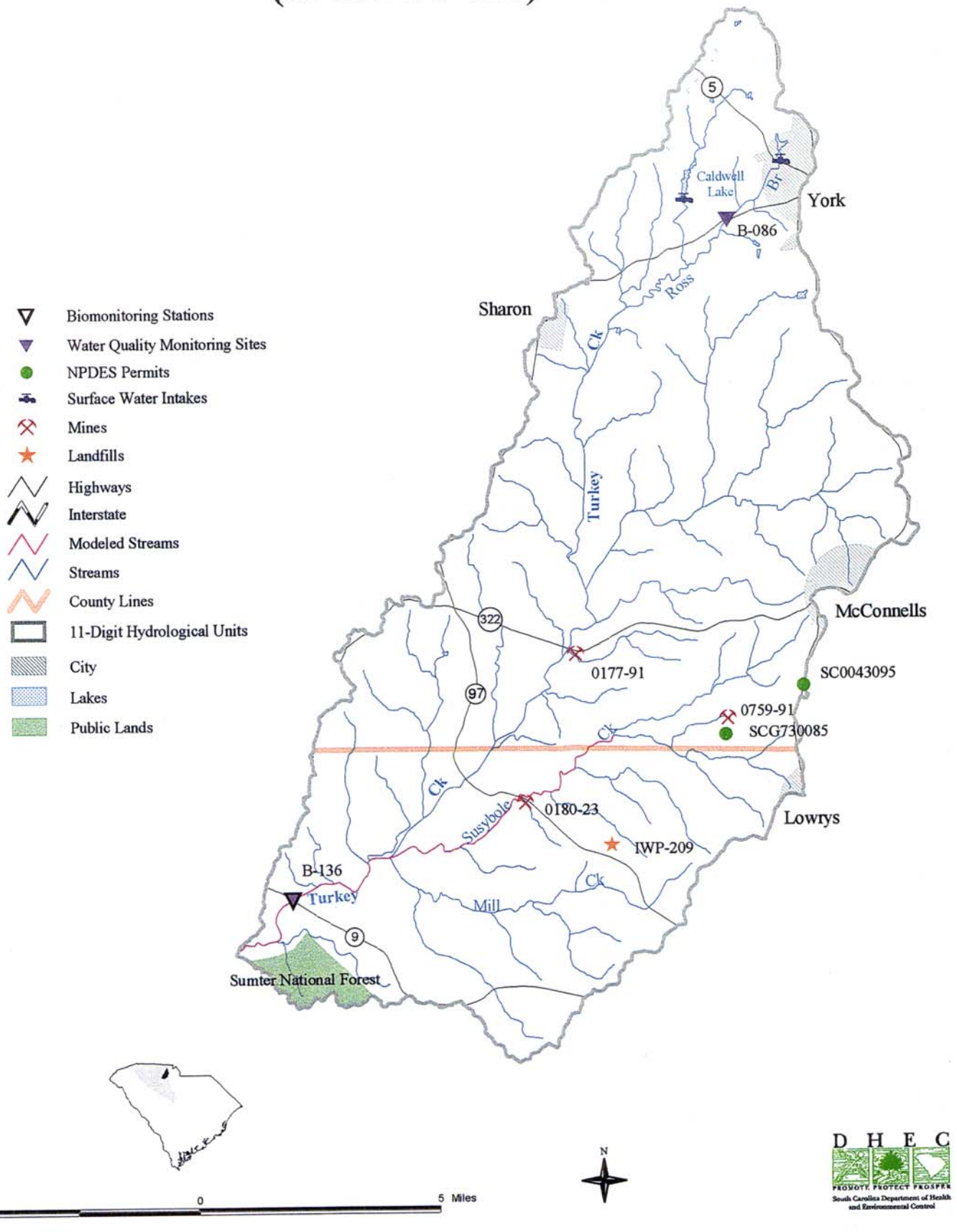
D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Broad River Watershed
(03050106-010)

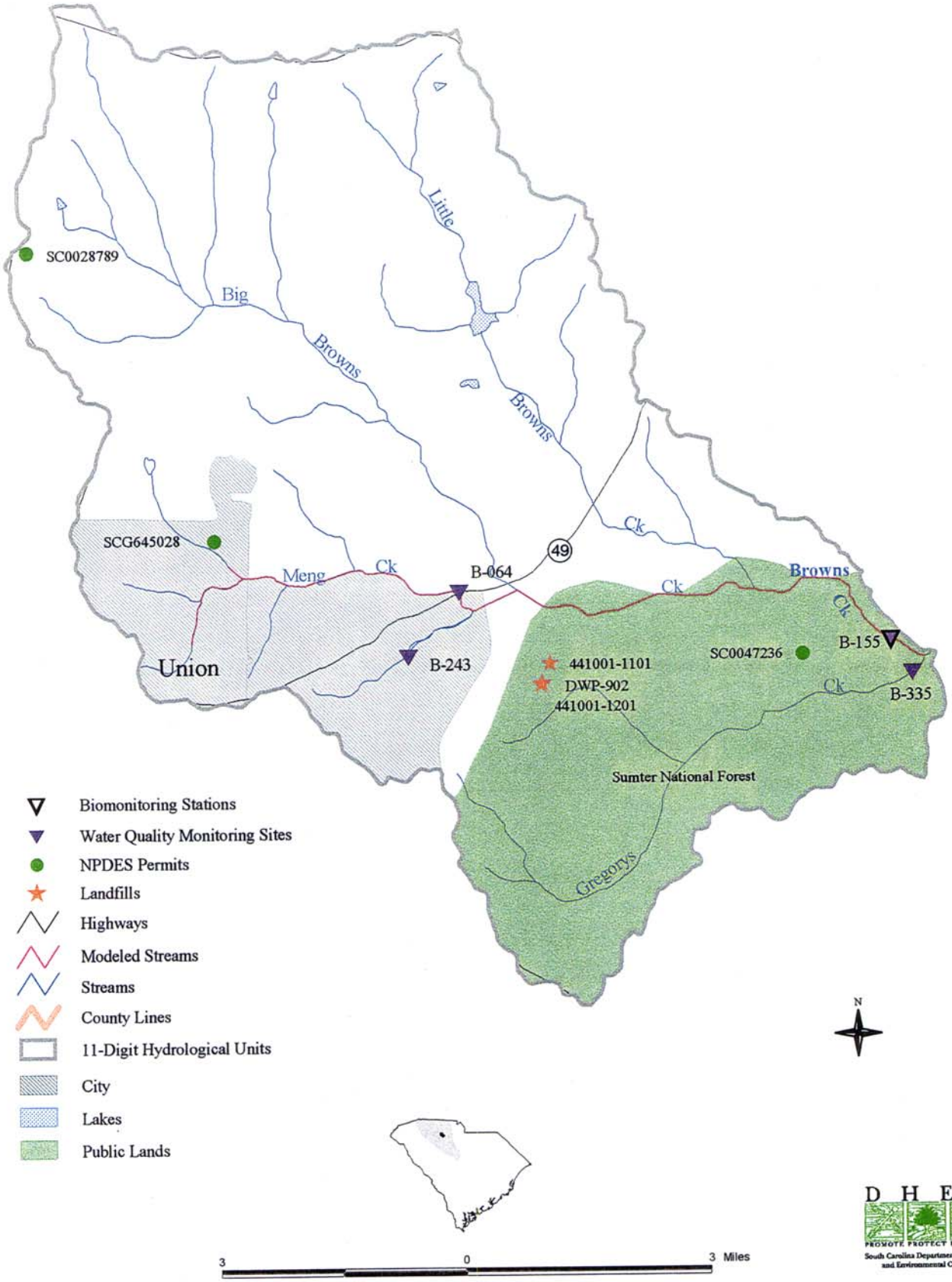


D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

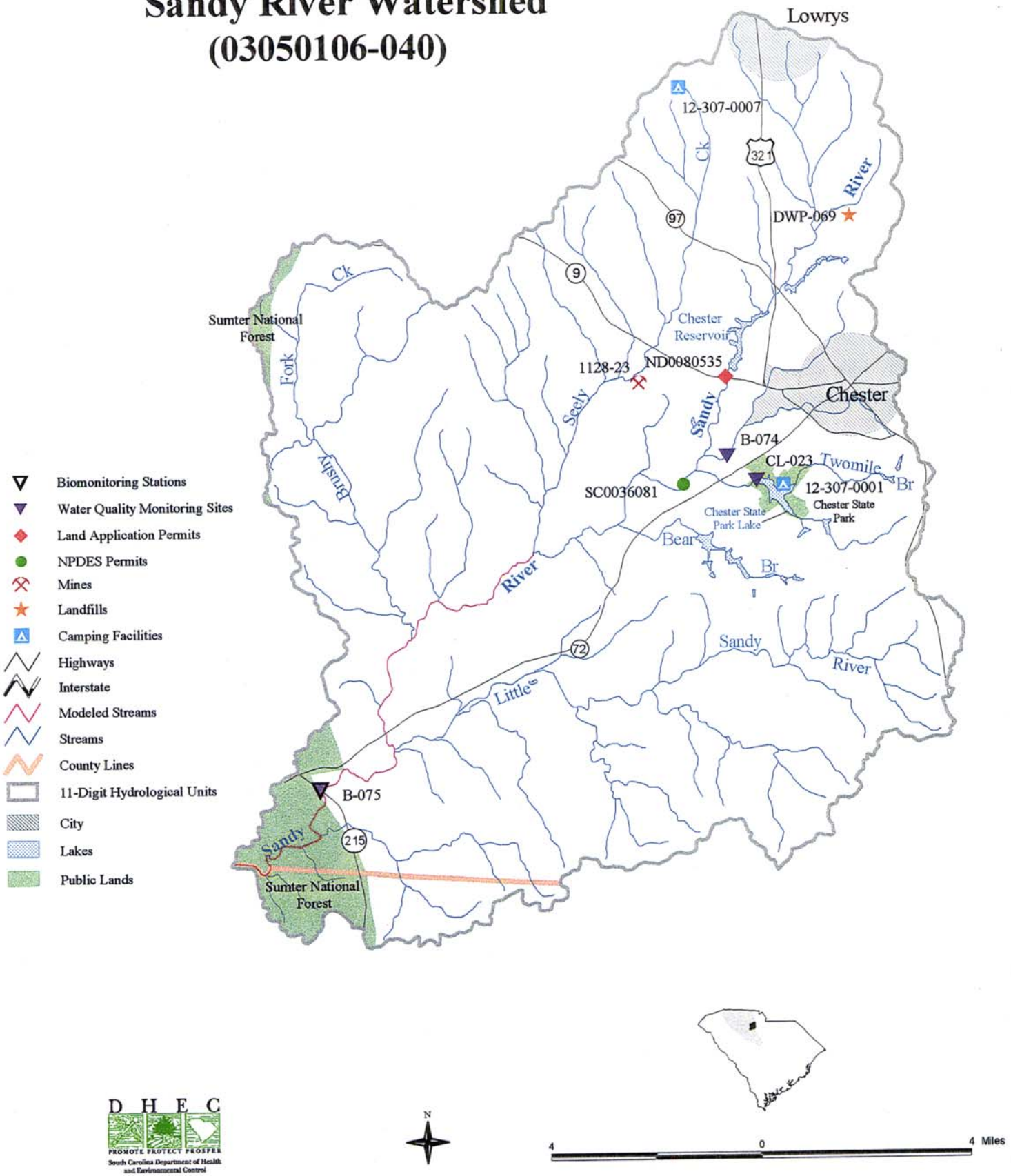
Turkey Creek Watershed
(03050106-020)



Browns Creek Watershed
(03050106-030)



Sandy River Watershed (03050106-040)



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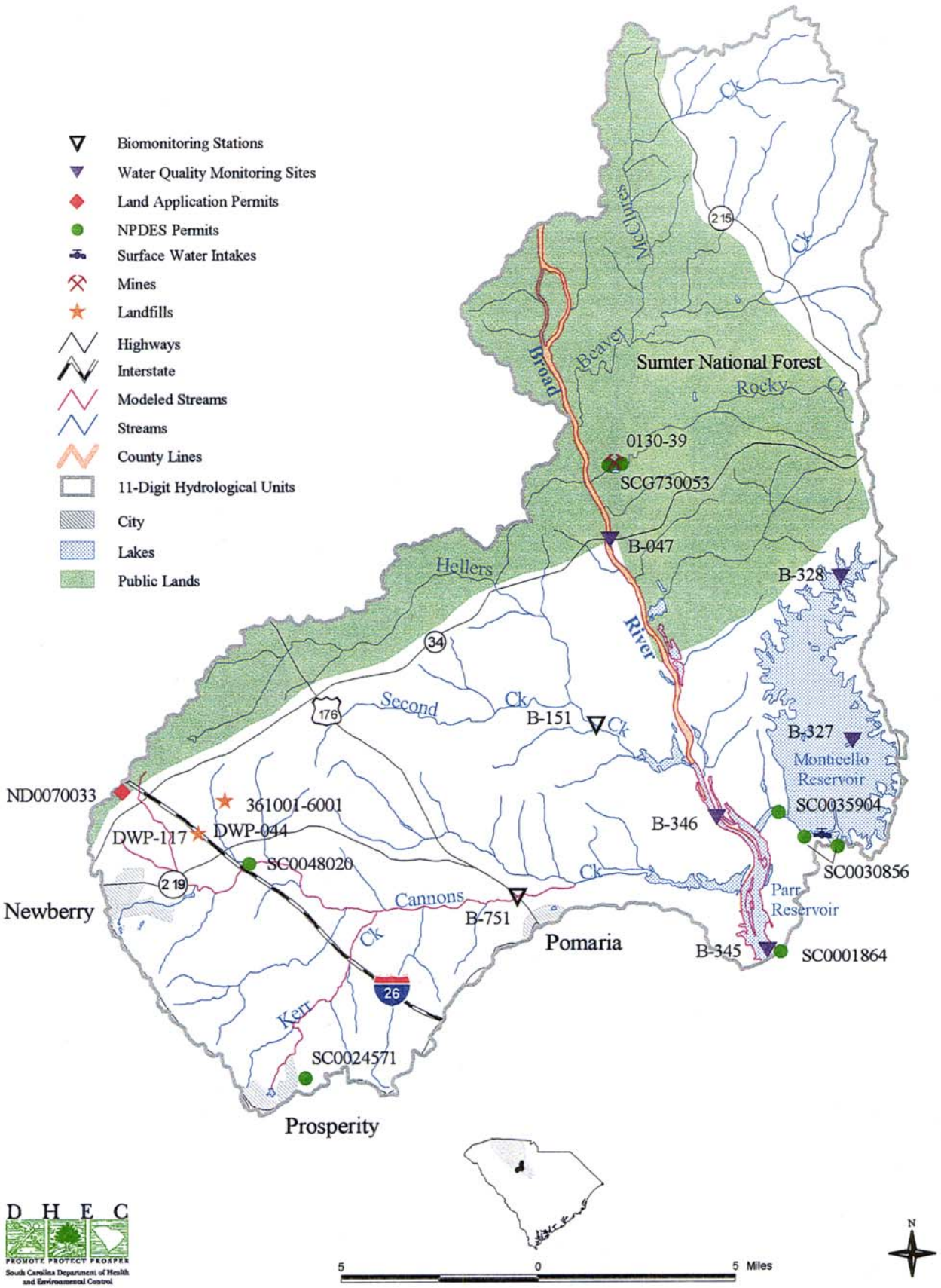
Broad River Watershed
(03050106-050)



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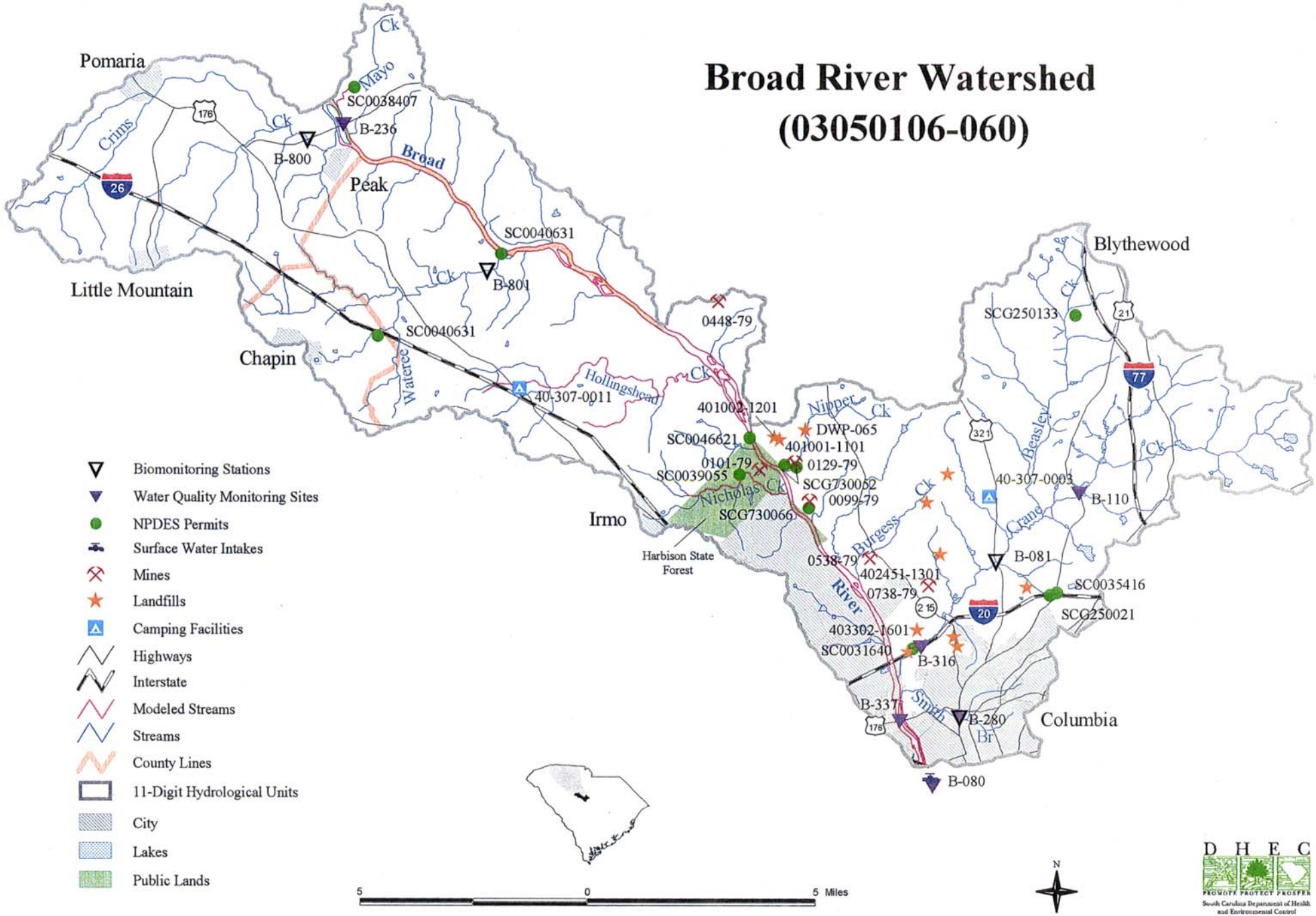
Broad River Watershed
(03050106-060)
Pomaria
Little Mountain
Chapin
Peak
Irmo
Blythewood
Columbia
Harbison State Forest
Crins Ck
Mayo Ck
Broad River
Wateree Ck
Hollingshead Ck
Nicholas Ck
Nipper Ck
Beasley Ck
Burgess Ck
Crane Ck
Smith Br
SC0038407
B-236
B-800
SC0040631
B-801
SC0040631
40-307-0011
0448-79
401002-1201
DWP-065
SC0046621
401001-1101
0101-79
0129-79
SC0039055
SCG730052
0099-79
SCG730066
0538-79
402451-1301
0738-79
403302-1601
SC0031640
B-316
B-337
B-280
B-080
SCG250133
40-307-0003
B-110
B-081
SC0035416
SCG250021
Biomonitoring Stations
Water Quality Monitoring Sites
NPDES Permits
Surface Water Intakes
Mines
Landfills
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Modeled Streams
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County Lines
11-Digit Hydrological Units
City
Lakes
Public Lands
5 0 5 Miles
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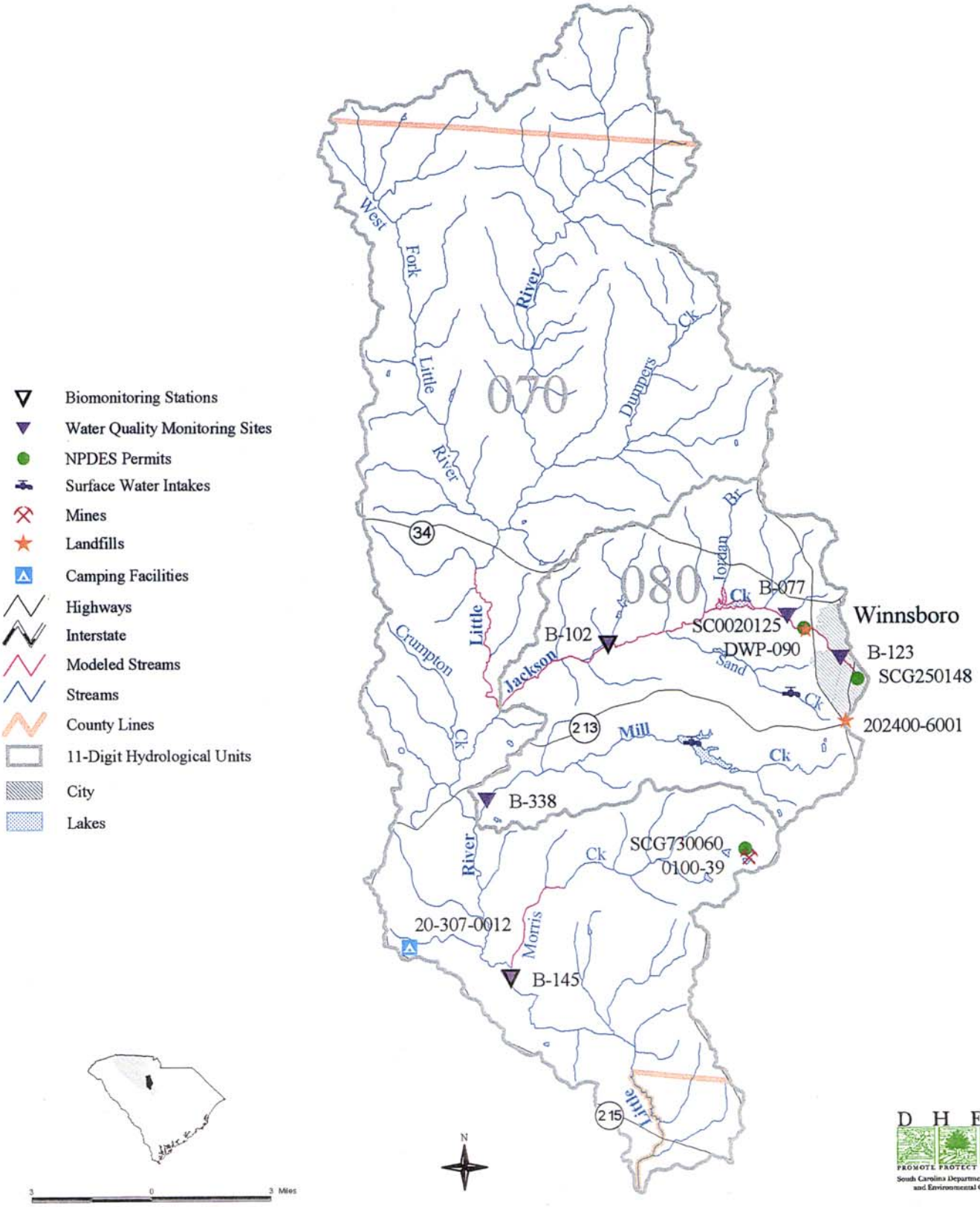
Little River and Jackson Creek/Mill Creek Watersheds (03050106-070,080)



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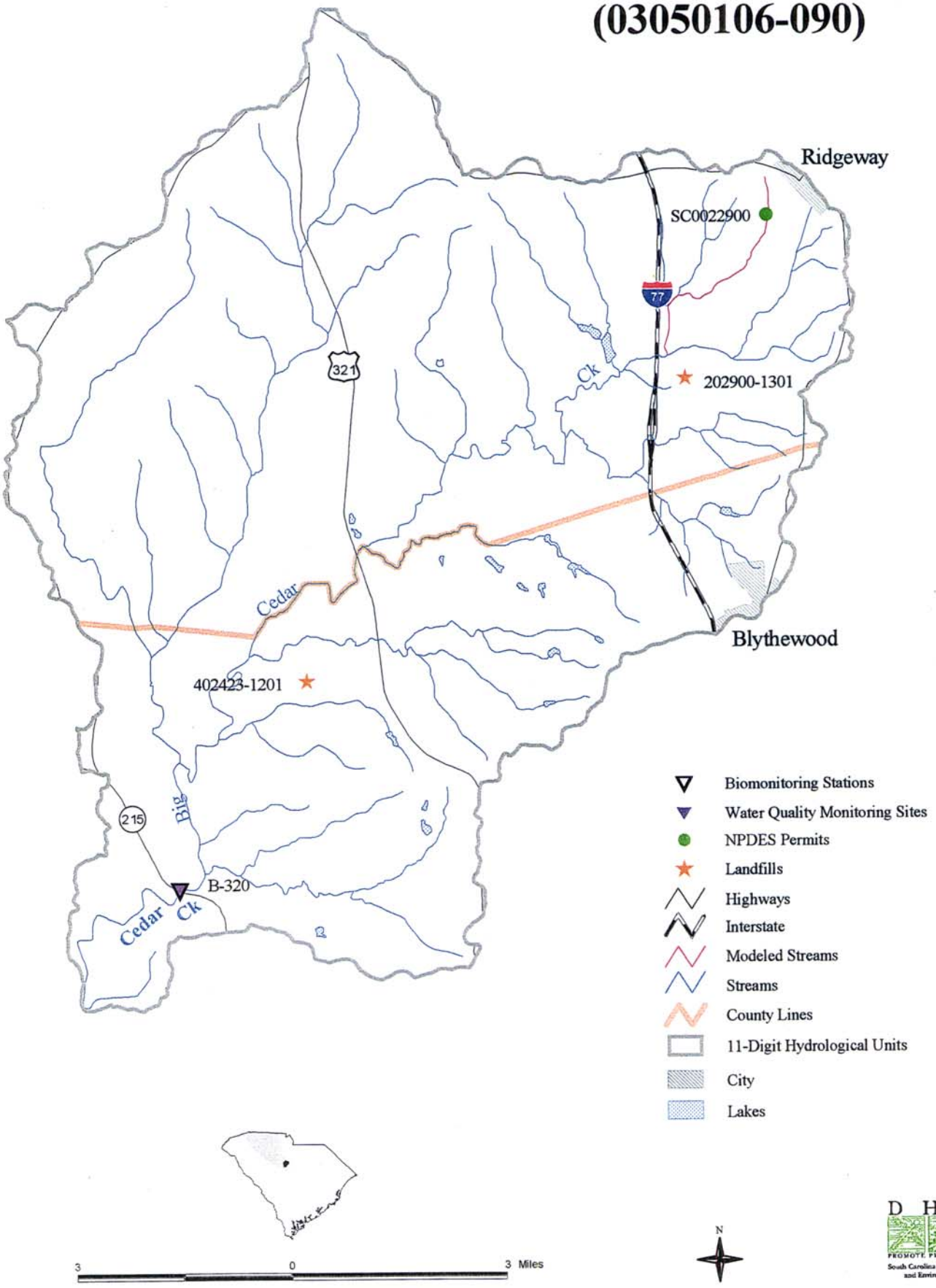
Cedar Creek Watershed
(03050106-090)



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Land Application

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